# FISH FACTS AND FANCIES

RECOLLECTIONS
OF
FRANK GRAY GRISWOLD

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"GRISWOLD GRAY"

**F. GRAY GRISWOLD**

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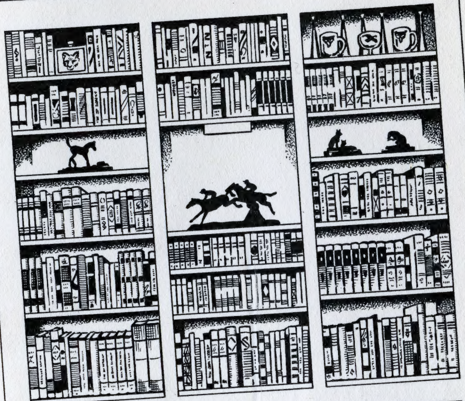
M . Gray Griswol
stri ng little book (pri . Now
the author has been goo book (also
privately printed) entitled *Fish Facts and Fancies.* It is a collection of short essays on a few aspects of angling and the ways of fish. It is quite a little book (only 132 pages of text, with seven plates), but it contains a lot of "stuff." As he proved in his earlier volume, Mr. Griswold has a great knack of putting his finger on the spot, and his theories and explanations are always interesting.

Part of his book is naturally concerned with salmon, and he shows himself a supporter of the "natal river" creed. But he goes further than support and attempts explanation. With some interesting data, drawn from Europe as well as North America, he propounds a theory that a "race" of salmon belonging to a special river continues to choose that river because it normally contains the amount of oxygen which exactly suits them, "and that they recognise their natal stream by the familiar 'taste' of their home waters." We confess to having no alternative theory ourselves, and must take refuge in that valuable Scottish word "A'weel"! Later, Mr. Griswold discusses the senses of fish, dealing with sight, hearing, and taste. Incidentally, he has more to say about "doped" flies for salmon, a topic which he introduced in his earlier book. He invites one to a really fascinating course of experiment for many kinds of fishing with artificial lures. A comparison of the fighting powers of *S. salar* and *O. quinnat* is interesting. Mr. Griswold finds the Pacific salmon of 40lb. a much tougher proposition than his cousin of similar weight. Another topic is the future of the salmon rivers of Canada and the dangers that beset them. They are much the same as those in older countries, now in so many cases evolved out of "dangers" into a history of destruction. But Mr. Griswold includes among them rather seriously the existence of trout, and gives an instance in which the destruction of trout seems to have "made" a salmon river. But the trout of Canada are somewhat fiercer than *S. fario* in Great Britain, thank goodness!

Another chapter deals with tarpon and other big sea game. We are glad to see that Mr. Griswold declares against the light-tackle craze for sea monsters. Up to a point modification of gear is all very well, but it can certainly be carried too far. Another chapter treats of eels. We note that the author seems to take the eel's powers of overland voyaging for granted, and he gives some fairly conclusive instances of it. Altogether, it is a very interesting little book. It is printed by the Plimpton Press, Norwood, Mass., U.S.A., and the possibility of obtaining a copy might, perhaps, be referred to that firm. With sufficient demand Mr. Griswold might be induced to print a small edition for sale as in the case of his last book.

London Field on Vol I

200 Copies printed in 2 Vols and given away.



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# FISH FACTS
# AND
# FANCIES

GRAND CASCAPEDIA SALMON
*43-pound*

# FISH FACTS AND FANCIES

BY
F. GRAY GRISWOLD

S & Sons.

~~PRIVATELY PRINTED~~
1923

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# FISH FACTS AND FANCIES

# FISH FACTS AND FANCIES

"THE chief motive and jumping power of a fish is in its tail, which, as it hits the water, straightens out the curving body and shoots it forward, allowing the pectoral and ventral fins to strike flat with their full power. The caudal, dorsal, and anal fins have steering functions to perform, while the pectoral and ventral pairs of fins are chiefly intended for balancing purposes."

"Fish would be unable to navigate on an even keel without these horizontal fins, for the centre of gravity of most fish is toward the head or dorsal side."

"To help matters, a fish is supplied with an air-sack, which renders it bulk for bulk about the same weight as the water it displaces."

Some fish like cold water and seldom leave it, while other fish, the tarpon for example, are uncomfortable if the water is below 68°.

The salmon, after first leaving its birthplace, being a square-tailed fish and therefore a bottom feeder, passes its life, when not on spawning bent, in the deep sea.

According to the scientists, the bulk of sea water is relatively cold, for heat rays are quite lost at about 250 fathoms, so that even in the tropics the upper stratum of warmish water is comparatively thin. The ooze dredged from the floor of the tropical ocean is said to be too cold to handle with comfort. This is caused by the northerly creep of the cold waters of the Antarctic.

At the surface there is an automatic regulation. When the temperature rises there is increased evaporation which checks the rapidity of the rise; and if the temperature is lowered a blanket of water vapour forms which checks the rapidity of the fall.

According to Sir John Murray, at the depth of 50 fathoms it is probable that the temperature of sea water does not change

2° F. at any one place throughout the year.

In the great depths, the temperature of sea water is at freezing point (32° F.) at all times.

It is supposed that salmon dwell in the depths, but it is not known how deep the water is or, therefore, what temperature they are accustomed to.

The few fish that have been taken on trawls south of Newfoundland, and also many miles off the coast in the Pacific, are supposed to have been journeying or stray fish.

When the salmon arrive in the rivers of Eastern Canada in the late spring or early summer, the river water is from 38–48° F., but in early July I have tested the water temperature in the Grand Cascapedia River and found it to be as high as 70° F. (1921).

This great change of water temperature makes the fish listless, and it is not to be wondered at that under such circumstances the salmon can with difficulty be enticed to rise.

One of the peculiarities of the salmon is that it is one of the few fish that is not only comfortable in both salt and fresh water, but can also probably stand a water temperature that varies from the freezing point to 70° F.

Most other sea fish that at times frequent rivers do not ascend above the head of the tide, but the salmon, sea trout, and shad go into fresh water, although the yearly visits of the latter are of short duration, for they return to the sea at once after spawning.

Some of the Atlantic salmon remain in the Canadian rivers all winter and return to the sea in the spring as kelts, while all Pacific salmon are supposed to perish in the rivers after spawning. Whether this is a wise provision of nature in order to prevent the salmon from increasing beyond their food supply in the sea is a question, but it is more probable that as the snow melts in the mountains the waters fall and the fish are unable to return to the sea from the spawning beds.

It is not known how the salmon find their natal rivers when they return to fresh water on spawning bent, but we have proof that they do so, for every salmon river has its distinctive type of fish.

At the breeding establishment at Stormontfield on the Tay, large numbers of smolts, which had been marked by the removal of the adipose fin, were taken as grilse on their return from the sea.

We seldom take salmon under 17 pounds in weight in the Grand Cascapedia, but last season there was a run of 8 and 9 pound fish of a type quite different from the native salmon.

These were evidently fish from a smaller stream that had been prevented from entering their natal river owing to a log-jam or other obstruction.

The last two seasons had been years of low water conditions, and in some rivers a two years accumulation of logs was floated down on the high water in 1922.

The salmon in the Upsalquitch, which is

an affluent of the Ristagouche River, average from 7 to 8 pounds, whereas the Ristagouche fish are double that in weight, averaging 18 pounds.

The former river was stocked for a number of years with the fry of the main stream, in an attempt to increase the size of the Upsalquitch salmon, but it made no difference in the weight of the latter nor was there any evidence that the fish ever returned.

Salmon prefer rapidly running rivers because the waters that tumble down rapids and over rocks and stones contain more oxygen than do the waters of leisurely running streams.

In the days when the river Loire in France was frequented by salmon, it was noticed that the fish entered the left branches of the river, the waters of which hurry down through the valleys from the central plateau, but none were found in the streams that flow slowly into the Loire from the plain on the right bank.

GRAND CASCAPEDIA SALMON
42½–30–30 *pounds*

It was evidently the quality of the water that they sought, water that was replete with oxygen.

Professor Jordan says that "salmon are 'geared' to the river to which they are native," and that fry should not be liberated except in streams to which they are geared.

It may be possible that they are geared to the amount of oxygen in the water that is grateful to them, as well as to the short or to the long and weary journey to the head-waters of their native river.

I have no doubt that the salmon return to their natal river, for the reason that it is there they find the greatest comfort, or in other words, the proper amount of oxygen in the water that is pleasant and necessary for their individual well-being, and that they had been accustomed to during their parr and smolt life.

I believe that the amount of oxygen that is necessary, differs with the fish of different rivers, and that they recognize their natal stream by the familiar "taste" of their home waters; just as a Bordeaux wine-taster is enabled to select his favorite claret.

It is very evident that, after a winter in the deep sea, those salmon which are inspired with the strong feeling of propagation become uncomfortable; for they lose their appetite and all their functions begin to work towards the fulfillment of the one purpose.

As the time approaches for their nuptial journey, the one thing they seek and which attracts them most is a greater amount of oxygen in the water.

All fish are uncomfortable at these moments and their breathing becomes labored and difficult. On this account the salmon approach the coast, attracted by the fresh water flowing into the sea from the rivers; for here they find more oxygen in the water than in the deep sea.

They not only select and enter rapid running rivers for the same reason, but also ascend to the headwaters and narrow parts of the streams, where the best aërated water is to be found, for the purpose of spawning; for there they can breathe more easily and life is more pleasant.

These phenomena do not take place yearly with all salmon; for the scales of the fish tell us that the majority of the salmon spawn but once during their lifetime.

This may happen with male fish when they are grilse, or with salmon in any year between the age of four and seven. Those that ascend the rivers for the first time, when six years old or more, are very heavy fish that have lived long and well in the sea without the fatigue of nuptial river journeys.

A few salmon do spawn twice or more, but they are the exception.

It is well known that the salmon are most comfortable when the water is cold; for their circulation and breathing are then slower than when the river water is warm.

When the river falls and the water becomes low, the sun naturally has a greater effect on the water temperature. At such times you will find fish lying at the head of a pool just below rapids or fast running water; for that water is aërated and easier to breathe. For the same reason you will find them in those pools that are fed by tributary brooks, just below where the cold brook water flows into the river.

The more rapid the water, the better sport it affords; for the salmon are better able to withstand a high temperature of the water if it is well aërated.

A rise in the river means an increase in the velocity of its waters, and more oxygen: therefore an increase in the vigor of the fish and better fishing.

The reason that the salmon do not all retire to the deep pools in warm weather, is that the temperature of the water in the pools does not vary much from that of the shallows, owing to the incoming warm water of the river current. The fish do, however, seek the shaded sides of the stream.

# THE SENSES OF FISH

# THE SENSES OF FISH

IT is not surprising that the Germans are not known as a race of anglers, for the somnolent carp is their national fish, and the salmon of the Rhine are not supposed to rise to a fly. They do, however, enjoy trout fishing in the streams of the Black Forest and at other places, and a few good books have been written by Dr. Heintz[1] and others on the gentle art in fresh water.

What interests me most is that several German scientists have studied fish in a most intimate and thorough manner. They have examined thousands of Rhine salmon and they are the chief authority for the belief that salmon do not feed in fresh water.

Fish are monocular and see a different picture with each eye. The outer surface of a fish's eye is flat to prevent injury in the water and to avoid unnecessary friction in swimming.

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[1] *Der Angelsport im Süsswasser,* by Karl Heintz.

The most interesting difference between the human eye and the eye of a fish is that the normal eye of a human being when in repose is set at farsight and must be focussed in order to see an object that is near by. Fish, on the contrary, are normally near-sighted, and their normal vision is set in repose at about 3 feet. In order to see at a distance the eye mechanism must be employed, and it is believed that they then cannot see more than 30 feet under the best conditions of strong light and clear water.

If the water is at all cloudy their vision is affected as the human sight is by a heavy fog.

Beams of light are broken as they enter the water so that a fish does not see objects above the surface of the water where they are but higher up. For example, a man walking along the bank of a stream appears to the fish to be walking in the air. All objects above the surface of the water appear to the fish to be swimming in the air.

A fish lying on the bottom of a stream has double the horizon that the human eye controls when looking down into the water. A fish, therefore, can see the angler long before it can be seen by the angler, and has time to scurry away.

Professor Hess has made some interesting studies of the effect of different colored light-beams on the eyesight of fish, and has come to the conclusion that most fish are totally color-blind.

He claims that fish see colors as a totally color-blind person does. Red to them looks black, white is the lightest shade, green is light grey, yellow and blue are dark grey.

If this is a fact, the multicolored salmon and trout flies, so interesting to look at and toy with, would be just as effective if tied with black, white, and grey feathers only.

Although fish have no outer or middle ear, they have an inner ear, or so-called labyrinth. Three canals run in circles from this labyrinth. It contains the hearing stones (*Asteriscus*), and, with the canals, is full of fluid.

The circles have to do with the stability of the fish, for if they are severed the fish wobble about in the water.

Fish do not hear as we know hearing, but are sensitive to strong sound waves on the water, and especially to those made under water.

For example, you may strike two stones together in the air without moving a fish but if you repeat the action below the surface you will frighten all the fish within a wide radius.

Dr. Kreidel made the following experiment at Kloster Kremsmünster, where the fish in a pond had for many years been daily assembled to be fed by the ringing of a bell. Kreidel had the bell rung from a distance by electricity without any movement of the bell itself, and not a fish approached. He then removed the clapper and had the guardian toll the bell. Although there was no sound the fish appeared in scores, attracted by the moving bell and by the guardian.

This seems to prove that fish "hear" strong waves of sound that jar the waters but do not hear different tones. They "hear" all movements on the bank of a stream, all the jarring sounds or noises in a boat or canoe, but do not hear the human voice.

Some fish have the so-called "power" of changing their color to suit their environment and for other reasons. This power is known as the chromatic function, and is supposed to be as automatic as is a maiden's blush.

It is influenced through the eyes by the sympathetic nerves, and is usually used for self-protection.

If you place a light-colored flounder on a dark bottom it will gradually adapt its color to its surroundings, and even become mottled if the bottom is covered with light-colored stones.

A totally blind salmon becomes black in color and one that is blind in one eye becomes black on the opposite side of the blind eye. The latter happens because the nerves of the eyes cross one another. The blind eyes, having lost their sympathetic power, are no longer charmed by the light and the color of the fish suffers.

The dark-colored back of a salmon is to protect it from its enemies in the air, while its silver sides and underbody prevent its enemies in the sea from readily seeing it against the brilliantly reflected light from above.

A fresh run channel-bass is quite light in color but soon becomes a dark bronze in brackish water, while the blue-green back of a tarpon becomes almost black, and it then is known as a black fish and one that will not take a bait.

Some fish become much more brilliant in color at spawning time, which is for the purpose of attracting the opposite sex.

After spawning the salmon lose their bright coats and become, through weakness and lack of nourishment, dark and slimy kelts. If they remain in the river all winter they do not regain their beauty until just before they return to the sea in the spring.

Some fish have a stronger sense of smell than others. It is most strongly developed in sharks, although they are not true fishes. They forage by night, have very small eyes, and rely greatly on their powers of scent, but most fish hunt their food by sight.

I have a great belief in the strong scenting powers of salmon which I have tested by occasional "doped" fly fishing.

One day last season, when the water was rising and the river was very dirty, I took in five hours five salmon that averaged 29 pounds, with a doped fly.

Another day, with salmon all about, I

could not rise a fish. In the afternoon I doped a fly and took three good fish, all of which were foul hooked in the "nose"!

This does not prove anything beyond the fact that the fish did not object to the scent, for you cannot be certain that it attracts them unless you can plainly see the fish you are angling for.

If a salmon rises short, and you scent the fly, and the fish does not return, it may mean that it has changed its position and moved up stream as they often do, or if after scenting the fly you hook a fish, it is never certain that it is the identical fish that rose before.

If you can plainly see the salmon, as sometimes happens, and having exhausted every effort to move it you then try the dope with success, it should mean that it is the scent that was the added attraction.

A fellow angler has written to me on this subject:

"I thought you might like to hear my

experience with the 'magic oil'[1] you were kind enough to tell me about last spring. I used it during the first part of the season with very good success. After the water became very low and clear it did not seem to work, nor did any of our other salmon flies do much. I had one or two very curious experiences with this oil. One day I was casting into a pool and saw a fine fish. I cast over him several times but he took no notice of the fly. I then poured a few drops of the oil on to my fly. Some of these fell into the water and passed directly over where the fish lay. He came up immediately to the top just as if he wanted to smell of the oil and the next time the fly went over him he took it. This happened to me three or four times with fish that I was unable to get up without the oil. I believe that when the water conditions are good the oil is helpful and brings up fish that might otherwise stay down.

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[1] Oil of Rhodium.

"I entirely agree with you in regard to the usefulness of magic oil in high and cloudy water. One experience of mine I forgot to mention in my last letter. We had a big rain early in June and the water was milk white. It did not seem worth while going down to fish, but as I had nothing to do I thought I would try it and put on some of the magic oil to see if the smell would attract them, even if they could not see the fly much. At my first cast I hooked and killed a nice fish and afterwards lost two others. As I was fishing with a moderate sized fly, I think it very doubtful whether the fish would have seen the fly at all. I did not see them until they had taken the fly. In low and very clear water, especially when the temperature of the water is high, I doubt if anything but a dry fly will get the fish up. At such times the ordinary salmon flies do not appear to be attractive, and I have even seen fish leave a pool to get away from them."

Scent is much more quickly diffused in

the air than in the water, yet it is readily carried by running water.

When casting, the salmon fly describes almost a half circle, so that the scent of a doped fly covers a wide area of the pool, yet when fishing with a scented fly for a fish that can readily be seen it is wise to "troutfish" by casting directly above the fish.

Fish are apparently intended to smell, for many fish have in place of the usual pair of nostrils two pairs of external openings, one placed above the other.

Water is drawn into these small pockets, which are lined with delicate membranes and brought into contact with the nerves of smell.

Their method of smelling differs from that of air-breathing animals who, owing to the air-tube system of smelling, have the power to sniff in pleasant odors or snuff out those that are unpleasant.

By drawing air in through the nostrils they can increase the pleasant sensation or by expelling the air avoid bad odors.

Some fish have no nostril pockets, the nerves being directed into external processes.

The salmon has a lateral line which extends from the tail to the head and ends in small dots or pores.

This line consists of fine tubes that are full of fluid, and are connected through minute holes in the scales by fine nerves with the so-called side-nerves of the fish.

With this mechanism a fish is enabled to judge the water pressure and know the direction and the strength of the current, and also when it is approaching an obstruction in the river.

It also enables the fish in the dark to find the branches of the river or the brooks it may be looking for.

# SALMON FISHING

# SALMON FISHING

THE reason we know so little about salmon is because, even in a river, it is so seldom that we can see their movements.

When angling for trout you can more or less rely upon their appetite, and often may fish for them when they are feeding, but as it is supposed that salmon do not need food when in a river you have to depend upon their whims and fancies.

The fact seems to be that they are most likely to take when the river begins to rise, and the lucky moments are shortened or lengthened by the rapidity of the rise. The quicker the rise, the shorter those lucky moments are.

The most propitious time to take salmon is when the river has cleared after a rise and begins to fall; for the rise of water having enticed the fish to move up stream, those that take are most probably newcomers in the pool which have not settled down at their new station.

There is nothing more tiresome than the monotony of casting the full length of a long pool, or the full length of a long day, without rising a fish. It becomes mechanical boredom as all expectation departs, but the single rise of a fish renews one's anticipation and banishes all sense of weary toil.

If a fish is hooked there is a feeling of satisfaction and pleasure that cannot be described, for the supreme moment in salmon fishing is the hooking of a fish.

Until I had taken a few salmon I could not understand the story of the Scotch nobleman, who after hooking a salmon always handed the rod to his gillie with the request that he should kill the fish, and after this had been accomplished resumed fishing.

The hooked salmon is a poor general, for he usually does most things that are to his disadvantage. A hooked tarpon always takes advantage of the current or tide, but the salmon, unless foul-hooked, usually goes up stream, in which case he must fight the force of the stream as well as the restraint of the rod.

That a salmon should desire to go towards the spawning beds is a pleasant thought, but why should the fisherman be invited to go there also?

When you take into consideration that a forty-pound salmon can be easily killed in a rapid running river in twenty minutes with light grilse tackle that pulls but a few pounds, and consider what a 10-pound bonefish might do under the same conditions, you wonder at the lack of determination of the salmon.

The reason for this seems impossible to fathom, for the 40-pound Pacific salmon I have taken in salt water at Campbell River, V. I. are very hard fighting fish that would utterly destroy my Cascapedia tackle.

The current in Discovery Strait is heavy and strong, and I have seen anglers fishing with stout salmon rods travel two miles on the tide with the tips of their rods in the water most of the time before they could stop the strong fish, and seldom avoid losing all their line or breaking their tackle in the attempt.

This would lead one to believe that it must be the change from salt to fresh water, or else the change of water temperature, that affects the energy and fighting powers of the fresh-run Atlantic salmon, or perhaps although not "too proud," they may be too fat to fight.

A 20-pound salmon is usually a better fighter than the heavier fish, for they do not fight according to their weight. The liveliest fish and the one that gave me the best sport weighed but 10 pounds.

I am aware that all this is piscatorial sacrilege, and that the salmon to most anglers is the gamest of game fishes, but, as they generally graduate into salmon fishermen from troutfishing, the larger fish naturally impress them greatly.

My opinion is, after all, the opinion of but one fisherman and he a sea-fisherman who, having fished the seven seas and experienced the thrills of battle with most of the giants of the deep, as old age approaches has taken up the more gentle art of salmon fishing.

Salmon fishing is the best sport that can be enjoyed in fresh water, and the life on a Canadian river is a continual joy.

The fascinating play of light on the running waters, the music of which is so pleasant to the ear, the contrast of the fresh light-green foliage of the deciduous trees and the dark shadowy branches of the pines, the bright blue of the Northern sky, and the life-giving purity of the air, become deeply engraven on the angler's memory, and once enjoyed are never forgotten.

## Club Waters Grand Cascapedia River

### 1922

### Six Rods

413 Salmon = 8478 pounds.
2 " over 40 pounds.
55 " 30 pounds and over.
113 " 17 " " under.
Heaviest fish, 42½ pounds.
Average, 20½ pounds.

### My Fishing 1922

75 Salmon =1553 pounds
49 " 20 pounds and over
10 " 30 " " "
Heaviest fish, 42½ pounds.
Average, 20.72 pounds.

### CASCAPEDIA CLUB WATER GRAND CASCAPEDIA RIVER
### 7 RODS

| Weight | 1918 | 1919 | 1920 |
|---|---|---|---|
| Fish | 336 | 209 | 248 |
| 40 and over | 8 | 1 | 3 |
| 39 | | 2 | 3 |
| 38 | | 2 | |
| 37 | 3 | 1 | 2 |
| 36 | | | 4 |
| 35 | 4 | | 2 |
| 34 | 6 | 4 | 3 |
| 33 | 13 | 3 | 8 |
| 32 | 10 | 8 | 8 |
| 31 | 4 | 7 | 16 |
| 30 | 16 | 10 | 16 |
| 29 | 9 | 10 | 10 |
| 28 | 14 | 9 | 7 |
| 27 | 24 | 11 | 11 |
| 26 | 42 | 18 | 8 |
| 25 | 40 | 22 | 9 |
| 24 | 34 | 11 | 10 |
| 23 | 15 | 14 | 22 |
| 22 | 19 | 14 | 23 |
| 21 | 12 | 20 | 20 |
| 20 | 8 | 8 | 10 |
| 19 | 5 | 10 | 11 |
| 18 and under | 48 | 24 | 45 |
| Total weight | 7866 | 4927 | 6009 |
| Average weight | 23.4 | 23.5 | 23.9 |

# CANADIAN SALMON RIVERS

# CANADIAN SALMON RIVERS

OWING to great sporting traditions and wise laws, the salmon fishing in the rivers of Great Britain has been preserved, notwithstanding that some of the streams flow through populous districts. The river Wye, once a great salmon river, passed through a bad period from over-netting, but in late years has been resuscitated by wise laws, and is to-day a fine salmon stream.

The rivers of France that flow into the North Sea, as well as those that enter the Atlantic Ocean, at one time harbored quantities of salmon; but the fish have been destroyed by over-netting, as well as by the pollution of the rivers. It was the custom, not only to over-net the estuaries of the rivers, but also to net the river pools and to poach the fish when on the spawning beds.

What did the greatest harm, however, was the taking of the smolts on their way to the sea.

These little fish, on their first journey to the sea, remain in the estuaries for a few days in order to become accustomed to the change from fresh to salt water. The temptation to take them in quantities was too great to be resisted by the Frenchmen, who often sold them openly in the markets.

A few salmon are still found in the Adour, Allier, Auluc, Authie, Aven, Bidassoa, Canche, Covesnon, Dordogne, Ellé, Elorn, Garonne, Gartempé, Gave d'Oloron, Gave de Pau, Loire, Meuse, Nivelle, Nive, Siene, Sée, Sélune, Thorion, and Vienne rivers.

There used to be salmon in the Seine, Marne, and Oise, but the pollution of the rivers, as well as the depredations of mankind, have destroyed all the fish.

The taste for salmon fishing has greatly increased in France in late years. The anglers are buying up the nets and attempting to restock some of the rivers. It is to be hoped that they may succeed, not only on account of the sport, but also because from the Customs statistics it has been discovered that over $1,000,000 worth of salmon on ice is imported yearly.

There are a few rivers in Spain, that rise in the Pyrenees and flow into the Atlantic, which still contain salmon. The Anson and the Eo would be good salmon streams at the present time, were it not for the netting of their pools.

It is well known that in the northerly rivers of our east coast, salmon were at one time abundant; but that the dams that were constructed prevented the fish from reaching their spawning beds; and the saw-dust from the saw mills choked and destroyed the fish by wholesale. A few years of this treatment destroyed them all.

It is fortunate that the best salmon rivers in Canada run through wild and thinly populated country; yet it is with difficulty and at great expense that over-netting is prevented on many rivers, for the fishermen along the coast are ever ready to reap a harvest when the fish arrive in the early summer, and their methods are often not strictly within the law.

The day is fast approaching when the salmon rivers in Canada, especially those that are not owned by individuals, will be in great danger. The wasteful destruction of the timber, the demand for water power, the damming of the rapid rivers for the purpose of producing electricity, the increase of the population and consequent pollution, will all tend to destroy the fish.

Beyond controlling many of the nets by purchase or by lease, and having the rivers patrolled by guardians, little is done to improve the fishing by increasing the number of salmon in the Canadian rivers.

I believe that salmon netting and salmon angling can exist satisfactorily side by side; it is simply a question of wise regulation.

The future of a nation depends greatly upon the intelligent treatment of its rising generation. It is likewise with the salmon. If the parr and smolts are not cared for, the fullgrown salmon in a river will decrease in numbers.

What does the most harm in Canadian rivers is, to my mind, the superabundance of trout and sea trout.

The head guardian of the Grand Cascapedia goes up stream to the spawning beds every autumn to count the salmon. He tells me that this is possible for the reason that at about the time the majority of the salmon are ready to spawn, that they rise and lie on the surface, and that by climbing trees along the bank it is possible to count and estimate the number of fish that are in the river.

He says further that, although the trout assemble in great numbers when the salmon are spawning, he does not believe they do the damage that is supposed, by eating the salmon eggs.

He claims that, when the female fish deposits her spawn, many of the eggs are light and immature and that these float down stream to be devoured by the shoals of trout that lie in wait, but that they do not get the opportunity to eat many of the fertile eggs.

After the eggs are hatched and the little parr have to look for food, in fact until they descend the river as smolts bound for the sea they are always at a disadvantage if there are many trout in the river.

A river can support only a definite number of young salmonidæ, the number being determined by the amount of food available. Every trout must displace one or more salmon parr, for the food supply is limited.

The trout also devour the parr, especially in the spring when the trout descend from the lakes where they have wintered in a poor and voracious condition.

On many of the rivers of Canada the trout are carefully preserved; for the reason that it is supposed that, if the local inhabitants are allowed good trout fishing in the summer, they will be more inclined to spare the salmon.

In some of the rivers of the North Shore, the salmon fishing has been greatly improved by the systematic netting of the trout.

Comeau, who was the guardian of the Godbout river for fifty years, says in his book:[1]

"One of the worst enemies of the salmon is, in my opinion, the trout. Doubtless in making this statement I shall arouse the ire of a great many trout anglers, who very naturally wish to see their favorite protected.

"It is no uncommon thing to get a small trout on the fly when salmon fishing and to find a parr in its stomach about half its size. Trout were unmercifully netted and seined during the period the Hudson Bay Company had the monopoly of our northern rivers, and to this fact, perhaps, we can ascribe the continued supply of salmon in spite of the excessive netting. Experiences and observations go to prove that one cannot have an abundance of trout on a salmon river without the latter suffering.

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[1] "Life and Sport on the North Shore," by Napoleon A. Comeau.

"Prior to 1876 no salmon had ever been killed on the Trinity River with a fly. In July of that year I spent a week on it and killed two salmon and a few grilse and enough trout to fill three and a half barrels. The following year Judge Henry was induced to lease it and killed eight salmon, and the task of reducing the trout was begun. Three or four hundred of these would sometimes be taken in one haul of the net in one pool. With the diminished number of trout the salmon score kept increasing. The river changed hands but the warfare continued. The present score is now and has been for several years past, about two hundred on the average per season." (1902)

I have a great respect for trout fishing and for trout, but I do not believe it is at all necessary that they should be over-indulged in so rich and expensive a diet as salmon.

When you consider that the parr have to contend with the depredations of the kingfishers, sheldrakes, loons, ospreys, and eagles, as well as of their enemies in the sea, where they go as smolts, it is a wonder that any succeed in passing the nets and entering the rivers as grilse and full-grown salmon.

The Atlantic salmon is a most valuable food fish, and its destruction would hurt the gourmets much more than it would the few fortunate anglers who glory in the sport of salmon fishing. I believe there is much that could be done to protect the fish and it is wise to begin by protecting their offspring—the parr.

# WEATHERWISE
AND OTHERWISE

# WEATHERWISE AND OTHERWISE

**GENERAL SICKLES** once told me that he could always tell when there was to be a change in the weather, by the pains in the leg he lost during the Civil War. Many two-legged men are likewise gifted, for mended bones or strained muscles are often good weather gauges. It does not mean, however, that if you meet a lady in midsummer wearing furs, it will snow.

Birds and animals seem to have stronger premonitions as to changes of the weather than we mortals enjoy. The loons call, the crows croak, the blackbirds are noisy, and all animals seem to be restless and uneasy.

Blake[1] says: "Within modest but very useful limits, your hen is amazingly weatherwise. Though of mean intellectual capacity, she still has room in her head for two ideas. The clash between them develops her meteorological value. Food she must have, but she yearns most consumedly to keep dry; and it is given her to know how the future bears on ambitions that are possibly inconsistent. When it rains and is going to clear, sheltering she bides her time; but if disregardful of the rain she pecks draggedly through it, you may put your clubs away and go home. Where the weather is hopeless, extreme discomfort is preferred before starvation."

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[1] "In a Fishing Country" by W. H. Blake.

When you can see houses or other objects at a great distance with scintillating clearness, it means wet weather for the reason that the unnatural clearness of the air is caused by invisible vapor which is likely to turn into rain. Such beautiful days are called weather-breeders. Sounds also carry much further when there is much moisture in the air.

A rainbow in the evening is supposed to promise good weather, while one in the morning means rain. I cannot remember ever seeing one in the forenoon, probably owing to the high sun.

A weatherwise sailorman once told me that if the sun rises red it is a sign of stormy weather, but if it rises a bright clear yellow it indicates fine weather. If the atmosphere is grey and hazy at sunrise it promises good weather.

At sunset, if the sun sets red and not sharp enough to dazzle the eyes, fine weather is to be expected. Light grey and damp atmosphere at sunset is also a good sign, and means light winds. Small light clouds, a so-called mackerel sky, at sunset, promise fine weather and brisk winds.

Long streaky light clouds brushed back at the ends mean a change of wind. Small black clouds travelling fast mean strong winds.

If the sun sets in a dark unbroken cloud, it will probably rain, and grey clouds divided by green sky are a sure sign of wet weather.

Small black clouds with red borders mean storm with strong winds, and heavy grey and black clouds with copper-red borders promise storm accompanied by rain.

As I usually leave the river early in July, I have never been annoyed by black flies, yet it is wise to take precautions against all insects.

As insects hunt by scent, it is therefore always better never to use scented soap. Although they hunt by scent, they also have a strong preference for dark colors. A black horse will be covered with flies when a grey is almost immune, and, likewise, a black hat in a canoe is more frequented by mosquitoes than a grey one. The best color for fishing clothes in the northern woods is khaki, for it is the least attractive of all colors to both flying and crawling insects.

It is wise to land your fish on the windward side of the river, when possible, and thereby avoid the blackflies and mosquitoes.

Should you lose your way in the northern woods, and have no compass, the first thing to do is to find the north. If you know the prevailing winds, you may read the trees and bushes by their inclination, or, you will find mosses and lichens on the north side of trees and rocks where the sun does not shine. If you point the hour hand of your watch to the sun, half-way to XII is south. Should the sky be overcast, polish a coin, if you have one; if not, a finger nail may answer, and hold a match or pin upon it vertically. The upright match will cast a shadow made by the unseen sun. The constant habit of locating North grows to be an instinct.

Should you go into the woods from the river and wish to find your way back, bend the twigs from time to time as you go along; for the under sides of most leaves being light in color, they can readily be seen at a distance.

If lost, and you have friends in camp, a bonfire of birchbark will indicate your position by sight, as well as by smell.

# THE SULKING SALMON

## THE SULKING SALMON

THE first yearly canoe trip up the Grand Cascapedia from Middle Camp is always full of interest, for the topography of that part of the river changes from year to year.

As the thermometer often registers 30° below zero in the winter, much thick ice forms, which breaks up during the high water in the spring, and causes great havoc in this part of the river on its journey down stream. Pools come and pools go, for an ice jam, or a log jam, will sometimes change the course of the stream, and perhaps fill up an existing pool, or create a new one.

The banks of the river are torn away in places and you may not find the tree with the overhanging branches, where you parted company with the down-stream travelling big salmon of the previous year. It may have vanished, or else may lie a sad wreck at the head of the first rapids below.

Islands are sometimes formed by these jams, in fact there is now a large island, bearing upstanding trees, at the identical spot where a celebrated pool called Alman's was once located.

The river as a rule does not grow in width, but the channel changes, and the land makes where the old channel once ran. It is at first stone and rubble, but, with high water and during rain storms, soil is washed down from the banks of the river, and during the low water season vegetation begins to mend the wounds.

The great force of running water is in full evidence, but sometimes it has been of benefit to the angler; for he may find a new pool where a shallow spot had been the year before. This is always interesting, and a keen joy when the first fish is taken there.

On my first trip up stream last summer, I heard that a new pool had been formed by an ice jam at the upper end of an island that is one mile above Middle Camp.

At the upper end of this island the river divides. On the eastern side the waters run shallow, too shallow in low water for a canoe to navigate; but on the western side of the island there is a long, fast-running rapid that feeds two good pools below. The first is Commodore, named after Commodore Bourne, and the second is Doctor, a tribute to Dr. Weir Mitchell of fond memory. Above the island is Van Alen, once a good pool but now too shallow to be of service to the salmon.

It was close to the point of this island that the new pool had been formed. I fished it the first evening with good results, taking four fish that averaged 24½ pounds—22. 21. 23. 32. Late in the evening I rose a big fish several times but he refused to take any fly that was offered him. As it was getting dark and I was cold, I ordered the killig up and we paddled home to a late dinner.

The moon was just rising over the eastern hills as we arrived at the Camp and I was greatly impressed by the beauty of the scene. The river makes a turn just there and the dark pines on the far side of the beautiful pool 424, as yet untouched by the silvery rays of the moon, formed a strong contrast to the smooth waters of the eastern side of the pool which was bathed in bright moonlight.

I slept the sleep of the just. My last thought was of the big salmon that had fooled me, and my first thought on awakening was one of fear that he might have left his resting place, and moved up stream during that beautiful night.

Rastus, my bow-man, asked me where I wanted to fish. I told him I wanted the big salmon that had spurned me the night before, so we started up stream.

Two strong men can pole a Gaspé canoe up stream about as fast as a good walker can walk along a river path, that is, if the rapids are not too frequent and too strong.

We passed Harvey's Rock, fought our

way up Morancy rapids, and, as the water was high, went up the eastern and easy side of Alman's island to the new pool.

It was a beautiful clear morning with a gentle south-west wind blowing, an ideal fishing day. There was just enough wind to ruffle the waters and hide the movements of the angler, yet sufficient to cause an evaporation of the water, and to cool and aërate it, and supply the salmon with oxygen and good spirits.

My fur-lined short fishing coat was comfortable, for the air was crisp and it was air of a quality only to be found in the northern woods, health-giving air that you feel you can bite into.

The river was in full spring beauty. The pines and the spruces made a dark background for the tender young leaves of the maples and silver birch trees.

The Œnotheras were in bloom along the banks of the river, and many of the bushes were decked with white blossoms.

The birds seemed to appreciate the beauty of the day, for every now and then a kingfisher would fly past sounding a note that reminded one of the purr of a salmon reel. A mother sheldrake with a large brood of newly hatched ducklings struggled up stream, encouraging her young to follow her at a pace that was difficult for them to accomplish. When she had made up her mind that she could not avoid her approaching enemies, she hustled her brood into the bushes and then flew up stream alone landing on the river with much commotion in the endeavor to distract our attention from the place where she had hidden her young. As the canoe approached her, she soared high into the air, well out of gunshot, and returned down stream to her hidden ducklings.

There were both red and grey squirrels swimming across the stream as they often do. One day last season we saw numbers all swimming west and could not understand the reason, until the following day a forest fire many miles to the eastward of the river was reported. The squirrels must have scented the smoke long before we could.

I was fishing the Ledge pool that day with poor success, when a small and very exhausted red squirrel climbed up the stern of the canoe and sat himself down on the stern board facing us.

I was taking sea trout at the time, and when the stern-man would assist the "priest" in giving absolution to a trout, the squirrel would slip over the side holding on to the gunwale with one tiny paw and watch the proceedings with one eye. When the dead trout had been deposited in the bottom of the canoe, he would return to his former position.

There he sat for an hour or more. Before we started for home, the stern of the canoe was backed up to the bank of the river and the squirrel scampered into the woods, but sad to say we, without thinking, landed him where he had come from instead of where he was bound for.

There are three short drops in the newly found pool. I took three salmon that weighed exactly 22 pounds each on the first two drops, without seeing any evidence that the large fish was still there.

When I had nearly fished out the last drop, there was suddenly a great commotion in the water and I found I was fast to a heavy fish. He slowly took a turn around the pool and then suddenly made for the rapids.

I shouted, "Rastus the killig, foul hooked, by Jove!" Just then the salmon jumped at the edge of the rapids, and I saw that he was a large fish and apparently fairly hooked. He started down the rapids at railroad speed and took most of my line before we could get properly started. My line felt very thin and my reel looked very empty, but, with a couple of strong strokes of the paddles, the canoe went sailing down the rapids after the fish. We were then evidently travelling faster than the salmon could swim, for my line became slack and I had to "coffee-grind" and longed for a multiplying reel.

We were half way down the rapids before I was on terms with the fish. Then I found that my line led up stream and thought it must be foul. I shouted to the bow-man and he directed the canoe into a luckily situated little backwater, three quarters of the way down the rapids.

I now understood that the salmon was sulking in a deep hole between two rapids and I was delighted—delighted because it was my first experience with a sulking salmon. Being a sea fisherman, it is my habit not to give a hooked fish one moment of rest, so I fancy salmon cannot often sulk with me, but this fish had taken advantage of the unavoidable slack line and probably thought on reaching this deep hole, that he had gone down-stream quite far enough; or, perhaps, he was suddenly reminded of his up-stream struggle in navigating these very same rapids and was not inclined to undertake it again.

The fish would not budge, and, as I said, I was delighted, for, although I had no experience with sulking salmon, I had well thought out my mode of procedure under such circumstances.

It was quite impossible for me to change the direction of pressure on the fish, for the canoe could not be moved without either fighting its way up stream or drifting quickly down the rapids, and there was no place where I could land.

My bow-man wished to stone the salmon, or to try to stir him up with a canoe pole; this I objected to. After the men had exhausted all their propositions I told them I would show them how to move the fish.

I had provided myself with several large snap-rings, such as are used to hang rubber curtains around shower baths. I snapped one of these on the rod just above the reel, turned the rod over, lowered the tip, and allowed the ring to slide down the rod and line to the salmon.

The effect was instantaneous. The big fish came to the surface at once and started to swim up-stream. I kept the line taut but put as little strain as possible on the tackle, for I knew no salmon could pull the drag of that line against such a strong current.

The fish fought his way gallantly upstream for about one hundred feet, and then came floating slowly back tail first and drifted into the still backwater a thoroughly exhausted salmon. I nursed him to the canoe and he was promptly gaffed.

He proved to be a fine fresh run male fish that tipped the scales at fully 35 pounds.

The eight salmon from the new pool weighed 199 pounds, a goodly average of about 25 pounds each.

Since that experience, I am never without a supply of curtain rings.

# THE TARPON

THE TARPON

# THE TARPON

## (*Tarpon Atlanticus*)

THIS game fish has the local names of Tarpon, Tarpum, Grand Ecaille, Savalo, Sabalo, Savanilla, Savalle, Silver Fish, and Silver King.

He belongs to the family of Elopidea, and is the largest of the herring tribe. His habitat at sea is in the warm waters of the Atlantic Ocean and of the Gulf Stream. He is found along the coasts of Brazil and Central America, as well as among the islands of the West Indies and also along the gulf coast of Mexico. In the summer time tarpon are numerous all around the Gulf of Mexico and on the east coast of Florida.

A few fish have been known to appear in midsummer as far north as the New England coast. I have seen several in the New

York Aquarium that had been taken in nets in New York Bay. In the summer of 1919, I saw a fine specimen that was caught in a net in Narragansett Bay near Newport.

Little is known of the habits of the tarpon when in the open sea. I never met them at sea but once, and that was in the month of February along the edge of the Gulf Stream off New River Inlet. On that occasion I sailed through a large school on the surface swimming south.

Tarpon are often taken in the nets off Hillsboro Inlet, which is not far from where I met them.

They arrive among the Keys of lower Florida in small schools of an average weight in February, and from then on their numbers increase until midsummer. These schools of fish dwell in Bahia Hondo, Matecumbe Sound and other channels for a few days before working their way into the Gulf of Mexico. If a Norther blows they go to sea, and return later. Other fish enter the rivers of the east coast of Florida.

The building of the East Coast Railway greatly disturbed their customs, for many of the fairways they were in the habit of journeying through were closed by trestles and viaducts. At that time schools of fish appeared in Biscayan Bay, and many were taken off the mouth of Arch Creek. These fish were evidently looking for a passage through to the west coast, having found their usual route further south barred by the railroad.

On the west coast tarpon are to be found in Shark, Harney, Broad, Turner's and Losman's rivers, and among the Thousand Islands. In Surveyor's Creek, Estero, and the Caloosahatchee River, also in the Passes that divide the outer islands such as Captiva and Boca Grande, and up along the Gulf of Mexico.

These fish are supposed to return south in early November, but many remain in the deep holes of the rivers during the winter and do not show unless the water is at least as warm as 68 degrees.

Where these fish come from is not known, but they appear to arrive from the West Indies via the Gulf Stream.

There is another migration up the west side of the Gulf that appears to come from the rivers of Mexico. They begin to arrive at Aransas Pass in March.

It is not known where they spawn. Some people believe it happens at sea but, from what I have seen, I believe they spawn in brackish water at the headwaters of streams, or at the head of the tide, for it is there only that you find small fish.

Fifteen miles up rivers in Cuba I have taken large tarpon that were evidently spent fish, not only from their appearance but because they had little strength. It is possible they also spawn on the flats and sandbars inside the outer islands.

Tarpon are very susceptible to the cold, and love warm water. When in the rivers and not looking for food they will lie on the bottom, coming up from time to time for a mouthful of air and then retiring to their resting place, after which air-bubbles will arise to the surface.

It is this action that makes the natives insist that these fish have lungs and use them for breathing. Then again they will lie on the bottom for hours as other fish do, with little or no motion of the fins.

I once saw quite a school of large tarpon lying on the bottom in the Los Angeles River in the Isle of Pines. They took no notice of the launch, although we passed over them twice in seven feet of clear water.

I once caught a baby tarpon five inches long in a gill net in New River. He was badly gilled, yet lived all day in a tub. He did not act as other fish do, but allowed me to stroke him gently and, tarpon-like, showed no fear. From time to time he would rise to the surface as the large fish do in the rivers, then go to the bottom of the tub again, and in a moment the bubbles would slowly issue from his mouth.

The long lower jaw of the tarpon shows

that he is a bottom feeder, and lives on crabs; yet he also feeds on school fish such as mullet, needle fish, and the like.

Although the tarpon's mouth is as hard as stone, there is a very sensitive cuticle that covers the roof of the mouth. When you see a tarpon in a river jump you may be sure that a crab has nipped this cuticle. When they jump in the sea it may be done to get rid of ramoras.

I believe that the tarpon not only come to the rivers of Florida in the spring and early summer for the purpose of spawning, but that like the salmon they return to the same river as a rule, and that many fish remain in deep holes in the rivers throughout the winter.

This belief is based on the fact that in the late 80's and early 90's there were many tarpon to be found in the Peace River. During the freeze in 1894 many hundreds of tarpon were killed by the cold in this stream. The banks were lined with dead fish of the largest kind. Since that time, few tarpon are to be found in the Peace River.

I was in Florida at the time of the "Big Freeze," living in a houseboat on the St. Lucie River. The mercury went to 18 degrees, and the river water steamed and smoked. It was not the cold that directly killed the fish, but the cold seemed to have consumed the oxygen in the water, for the fish died from asphyxiation.

For two hundred miles both shores of the shallow Indian River were banked with dead fish, mostly so-called surface feeders such as snook, bluefish, and the like. The bottom fish did not seem to be affected.

I saw many bluefish of five pounds flopping along on the surface, but no mullet. These wise fish went to sea in schools the day before the Norther arrived.

We picked up nineteen green turtles that were benumbed by the cold and floating on the surface. These turtles were stacked on the lower deck of the houseboat and revived much to the consternation of the crew, although they were compensated for their troubles the following day when they disposed of the turtles at Fort Pierce for $200.

I have fished for tarpon in the St. Lucie River in midwinter. For days you would not see any fish but if you waited until after a few days of hot sun had warmed the water to 68 degrees they would begin to roll and show themselves and would then take live silver mullet bait.

It took me some time to find out how to keep mullet alive, for if you put them into a well in a boat they bruise their noses against the sides of the well and die.

I procured oat bags and laced barrel hoops around them on the outside. I then ran drawing strings around the mouths of the bags. After placing half a dozen live mullet, taken by cast-net, in each of several bags I practised with them to find out in what depth of water the mullet were most comfortable. I then tied the bags to the roots of trees along the bank of the stretch of river I proposed to fish. In this manner I always had fresh, live bait at my convenient disposal.

I found the new moon was the best day of the month to fish. One winter, on the new moon in January, I took a 187-pound tarpon; and on the following new moon, in February, I landed a fish weighing 165 pounds.

This fishing was done from a row boat; but in later years and since the advent of the Wilson spoon I have fished in a small launch. A live bait behind a launch soon dies and revolves like a pin-wheel which destroys one's line, but the Wilson spoon skitters and does not revolve in the water.

Tarpon are greatly attracted by this spoon, and it has been a blessing to me in Cuba where no mullet were to be had.

I built two fishing yachts, the Savalo and the Kona, for tarpon fishing in Cuba, and fished there almost every winter from 1904 to 1920.

I have cruised from Nipe Bay to the

westward around Cape San Antonio and as far as Cienfuegos on the south coast, and also to the Isle of Pines 60 miles south of Cuba.

Tarpon are to be found in certain rivers in Cuba at all times of the year. I say certain rivers, for the tarpon is a clean fish and does not favor muddy water. The soil of Cuba is red and rich, so that the streams that drain the cultivated lands are mostly muddy; in such rivers no tarpon are to be found.

There are large swamps in Cuba, and the rivers that drain these swamps run clear. It is in these rivers that the most fish are to be found.

The Rio Negro and Jatibonico drain over one hundred square miles of swamp, and in these rivers the tarpon abound.

The Damuji River is also a river of fairly clear water, and at times there is good fishing there.

These rivers are all on the south coast of

Cuba. On the north coast a small river with a long name, the Zaraguanacan, is often full of tarpon.

The fish do not seem to go above the tide. The limit of the mangroves, which do not grow along the fresh water, seems to be the limit of the tarpon from what I have seen, yet Mr. Zane Grey says he found tarpon one hundred miles up the Panuco River in Mexico.

The fish do not run as large as at some places in Florida, although I have taken fish of 130 pounds in weight and have lost heavier ones. The headwaters of the rivers abound in small fish. I have at times seen hundreds of tarpon that would weigh from 10 to 15 pounds and have taken them four inches long.

On one occasion I found a narrow stretch of the Jatibonico River simply alive with 15-pound tarpon. I landed 14 in an hour's fishing and must have "jumped" 25 more fish. At another time and in another river

I "jumped" 52 large tarpon in three days' fishing of the flood tides.

My fishing journal tells me that I landed 254 tarpon in Cuba, which means that I must have hooked over 1,000 fish, for it is not possible to save more than one hooked tarpon out of five fish hung on a Wilson spoon. The weight of the spoon helps the fish to free himself.

I invariably turned the hooked fish loose unless they were damaged. They sometimes bruise their gills in jumping and bleed profusely. In such cases the fish will not live if liberated.

The natives of Cuba spear tarpon and I am sorry to say net the small ones. Both there and in Mexico the fish are eaten fresh as well as salted.

My method of fishing in Cuba has been trolling a large sized Wilson spoon with sixty feet of line over the stern of a small launch. The launch travels at the rate of four miles an hour. If a fish is hooked in a wide part of the river I have the launch circle the fish. It is easy to land a 100-pound tarpon in 8 minutes by this method if you understand fighting fish.

If a fish is hooked in a narrow stream it is necessary to keep the boat away from the fish until he is well spent. In narrow streams you lose many fish for they jump into the overhanging branches of the mangrove trees which line the banks and tumble back into the water leaving your tackle entangled among the branches.

The Cauto on the south coast is the only river in Cuba that is navigable. The other streams are often from eight to ten feet deep, excepting where they flow into the sea; here you will find wide bars with but four feet of water.

It is a delight to fish in these rivers in winter for there are no sharks to rob you of your fish nor any insects of any kind excepting a few mosquitoes at sunset if your yacht happens to be five or ten miles up a river and moored to the windward bank. The rivers are lined with mangroves and dotted here and there along the banks with royal palms, the most beautiful of trees.

Of this tree Davis wrote: "The royal palm is the characteristic feature of the landscape in Cuba. It is the most beautiful of all palms and possibly the most beautiful of trees. The cocoanut palm, picturesque as it is, has a pathetic resemblance to a shabby feather duster and its trunk bends and twists as though it had not the strength to push its way through the air and to hold itself erect. But the royal palm shoots up boldly from the earth with the grace and symmetry of a marble column."

At sunset the small white cranes and egrets fly upstream to their roosts. They flit along close to the surface of the river and it is amusing to watch the tarpon rise at their shadows as they fly by.

There is a pond of brackish water on Pine Island, Florida, which has no outlet to the sea and contains many quite small tarpon. The spawn must have been dropped by birds or carried to the pond on the backs of alligators. Owing to the poor food these fish do not increase in size.

I do not take any interest in fishing for tarpon with so-called light tackle. I believe a 15-thread line is quite light enough and that the "punishment should fit the crime." In other words the charm of heavy fishing is being "up against" a big fish and landing him as quickly and as humanely as possible. The chief pleasure is the give and take between man and fish.

The theory that fish are cold-blooded creatures and therefore do not suffer is all very well as a theory but I never want any fish to dangle at the end of my line and eventually commit suicide.

What anglers mean when they tell stories of fighting a salmon for an hour or longer is beyond me. Any salmon up to 45 pounds in weight ought to be killed in twenty minutes even with light grilse tackle if the angler knows how to fish.

Fishing with a 16-ounce grilse rod I once rose, hooked, landed and weighed in 50 minutes, five salmon that weighed 128 pounds. This was not done with intent but in the regular course of fishing.

What I do believe in is fishing for tarpon with a plain reel without any drag. The science of tarpon fishing was lost when the reel drag was invented. It came about in the following manner:

The science of sea fishing was first developed along the Atlantic seaboard in the early 60's and the Striped Bass (***Roccus lineatus***) was the interesting fish which started this development.

The multiplying reels and Cuttyhunk twisted linen lines were invented for this purpose, it being discovered that these fish were too quick for the old single action reels and that the braided cotton lines were not strong enough to hold these active, agile fish.

The method of fishing was casting a bait into the white tumbling surf from the rocks or from stands built for that purpose.

The three jointed rods of ash or lancewood used at first were later abandoned for two-piece rods of Japan or Calcutta bamboo, and these rods were later developed into the two-piece split bamboos with guides and tips of agate of the present day.

The reels had no drag but were supplied with a musical click of small value. Later on in the 80's a light drag was placed on the left side of the reel for tarpon fishing, to prevent the line from over-running in case of carelessness.

The first tarpon fishermen were old bass fishermen who had learned the trick of playing heavy fish with rod and reel and they all fished with the right thumb on the reel as it had been their custom so to fish when casting.

A few of us took up tarpon fishing without ever having done much bass fishing and we fished with the left thumbs on the reels and pumped the fish with our right hands.

This method had a great advantage for the right hand was always free, away from the reel handle and out of danger, yet always ready to reel in the slack.

The man who attempted to check a fish with his right thumb on the reel and then reel in the slack with his right hand was always in danger of the back lash of the reel handle.

E. H. Vom Hofe, the celebrated tackle manufacturer, was one of the first and most successful tarpon fishermen, and, being an expert bass fisherman as well, always fished with his right thumb on the reel.

We often discussed the two ways of fishing and I could not persuade him that my way was right and his way was wrong until one day as he was playing a heavy fish at Captiva Pass the reel handle broke his right thumb.

The Rabbeth drag had already been invented but was taboo according to the Tuna Club Rules, so Vom Hofe sat up nights until he had perfected the reel drag as we know it to-day.

He showed it to me and I had the first reel made with the new invention. He described it to me at the time as a "reel with which a man can fish who has no thumbs at all." (1902.)

Later on the B-Ocean reel was adopted by Mr. Boschen, the greatest fisherman of all time, with a free running spool and stationary handle for heavy sword-fishing, for this fish takes sudden dives of two hundred feet and more and if you cannot quickly free the line your rod is pulled out of your hands or broken.

The tackle as it exists to-day is capable of holding and landing a 1,000-pound game fish and the reels will hold 1,200-feet of 24-thread line.

The drag is necessary for swordfish, marlin, and giant tuna, for you cannot fight such heavy fish for four and more hours with thumb pressure only, but for tarpon and tuna up to 200 pounds in weight thumb pressure is quite sufficient and much more sportsmanlike.

I killed five tuna that weighed 491 pounds in six hours with a plain reel and have landed very many tarpon weighing from 187 pounds down without any reel drag, so I write of my own personal experience.

With the invention of the reel drag the science of tarpon fishing received a *coup de grâce.* It is no longer fishing but "coffee grinding" and the fish have no chance whatever.

I have seen men at Boca Grande block the line at the first jump of a tarpon, start the launch engine and tow the fish ashore with his mouth wide open.

That is not fishing; it is murder!

Tarpon can readily be killed on light tackle, only it takes more line and more time and the rod enjoys most of the fun.

With light tackle you must follow the fish, with heavy tackle the fish comes to you. As hooked tarpon always float with the tide or current it is at times hard work, but when you hear of a fisherman who has been an hour or more killing a tarpon you may be quite certain he has been trying to pull the heavy fish against the tide.

The Light Tackle Club at Aransas Pass died a natural death, for many members have told me they gave up going there because they wearied of light tackle yet did not like to go back to the only real sport, heavy tackle.

Mr. L. G. Murphy holds the Aransas Pass record for light tackle, a tarpon 6 feet 9¾ inches long.

At Catalina Island a marlin of 185 pounds and a tuna weighing 145½ pounds have been landed with light tackle by Mr. Jump. This is done by setting the drag at the proper tension so that a long run of the fish will not break the line. The angler holds the handle of the reel which works but one way when the drag is on. The fish takes the line from the reel with the set drag and the fisherman reels in the slack when he can get it. It takes skill, time, and patience but to me it does not give the satisfaction of being "up against" a big fish.

If the advocates of light tackle for tarpon would go back to the plain reel instead I can promise them plenty of exercise and entertainment.

I am greatly interested in all fish and have a real affection for the tarpon. He is a gentleman among fishes. He is not in the least afraid of man or boat and when once hooked does not attempt to run away or take advantage of his great strength.

His one idea is to get rid of the hook which annoys him and he will jump clear of the surface many times and attempt to free himself. If these tactics fail he will then swim close up to the boat, raise himself out of the water and shake his head. It is then that he is usually lost.

He is the grandest and most beautiful silver fish that swims and he has the best manners of any of the denizens of the deep, for he avoids all snags, stumps, or obstructions in a river when hooked and never takes advantage of the fisherman but fights square.

I have the greatest admiration for this Silver King of sea fishes.

## METHODS OF TARPON FISHING

The first tarpon were taken bottom fishing. It was the custom to anchor the boat at some chosen spot that was frequented by the fish and then to chum with pieces of cut mullet. Two hooks baited with the better part of a mullet on each hook were cast out. The angler watched one rod and his guide took charge of the other.

I always took pains that my rod pointed towards the spot where my bait lay so that when the latter was picked up the line would run free from the reel. The fish was allowed to take fifty feet of line before striking because a tarpon will pick up a bait and move off with it in his mouth before gorging it.

The theory that loose line must be coiled in the bottom of the boat was for novices that could not pick up a rod without checking the fish.

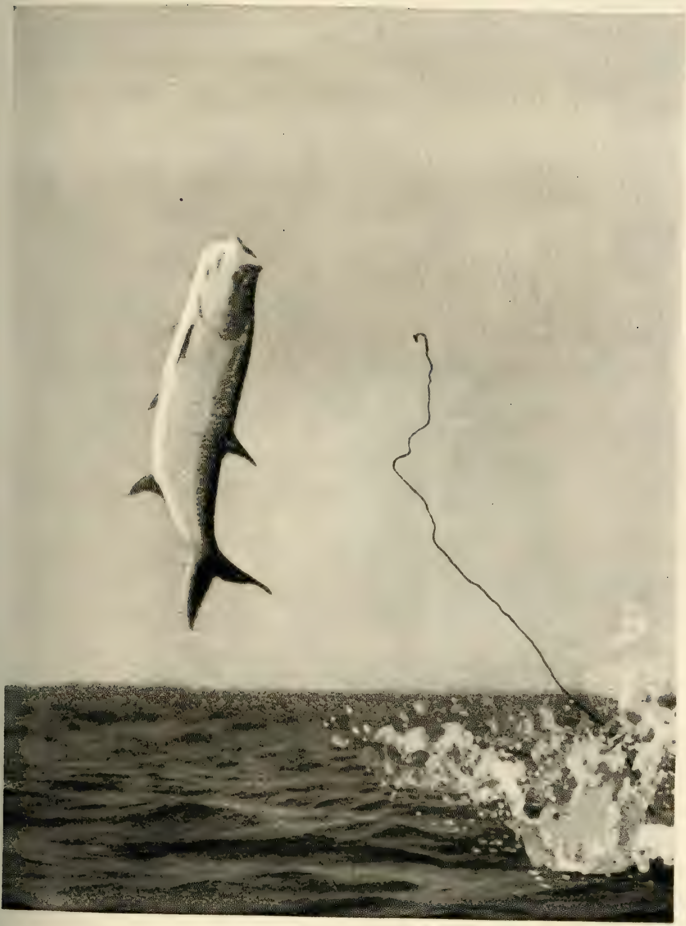
Tarpon that have gorged the bait, unless hooked in a vital spot, fight much harder than those that are hooked in the mouth.

The drawback to bottom fishing was that the fish were all destroyed and could not be set free.

The snoods were made of deerskin or cotton cord partly for the reason that wire is stiff and the fish would drop such a bait and also that if a shark picked up the bait he would bite through the snood and free himself.

I always used the snoods made of three strands of fine wire twisted. They were not so easily seen, were pliable and took more fish, besides I enjoyed playing the mackerel shark for they are great jumpers and strong fighters.

When the Van Vleck hook was invented the general method of fishing changed. It had been discovered that when trolling the greater part of the fish were hooked over the incisors which are very large in the tarpon and that the fish would jump and throw the hook. Mr. Van Vleck had hooks made with



*Julian Dimock*

TARPON THROWING HOOK

the belly nearer the point of the hook, which made it more difficult for the fish to get rid of the hook when jumping.

I say this hook was invented, yet I have seen in the Naples Museum, the very same hook found in Pompeii (destroyed A. D. 79) and probably used for trolling for tunney-fish.

We then either trolled for tarpon or anchored in strong tideways in the Passes with a strip of mullet for bait and with one hundred feet of wet line. When a tarpon was hooked your guide would throw the buoyed anchor rope overboard and you would follow the fish. Having your anchor buoyed saved time and it also gave you a reserved position to return to.

When Mr. Mygatt discovered Boca Grande as a fishing possibility (1898), owing to the great depth of water there drift fishing was adopted.

The leader used is of heavy strong piano wire six feet in length and at the upper or rod end of the leader a sinker is fastened to the swivel or ring with a light piece of string. The hook is baited with a live blue crab or a strip of mullet. The launch goes under power to the entrance to the Pass and drifts in with the tide. The fisherman keeps the hook off the bottom, in other words slowly trolls the bait close to the bottom where the tarpon lie.

As the depth of water changes, the length of line is changed. If you hook a fish his first jump frees the sinker. The drawback to this fishing is that the sharks are numerous and steal the hooked fish.

To my mind this is the most uninteresting form of tarpon fishing, for to hook a fish near the bottom in 60 feet of water does not give the same sensation as travelling along at four miles an hour and hooking near the surface, a fish that immediately leaps in the air. A tarpon will also jump twice as often in 8 feet of water.

I have seen forty or more boats drifting fairly close together at Boca Grande on a moonlit night and consternation caused among them by the sudden jumping of two or three large hooked fish.

It is a popular and lazy form of sport where fish are plentiful, and as the tarpon is an elusive fish and difficult to find, Boca Grande is much frequented for the fish are known to be there in numbers.

To me the great charm of tarpon fishing is to hunt for the fish and find them, which you can do in rivers as they often swim along the surface, or if lying on the bottom come up from time to time for air.

Fish hooked in the mouth can readily be set free. Your guide is provided with a large barbless release-hook which he inserts in the fish's jaw and then removes the fish-hook with his gloved hand.

The season for tarpon fishing in Florida is from the month of May to October.

At Aransas Pass, Texas, they fish in the Gulf outside the jetties with live or dead silver mullet. The drawbacks are the rough water and the numerous sharks. June and October are the best months.

When I was in Tampico, Mexico, the method of fishing was trolling a dead silver mullet behind a row boat. We fished at the jetties seven miles below the town or ten miles up the Panuco River above Tampico. There is also a Laguna that contains small tarpon. Owing to the trade wind, afternoon fishing is difficult. The best months are February and March.

In the Panama Zone, the fishing is done from the shore below the spillway of the Gatun Dam. The method of fishing is with the fly and the season is from May to November. If the Canal had no locks the tarpon would now be in the Pacific as well as in the Atlantic Ocean.

### ADVICE

When going seafishing I always choose from the new to the full moon, for fish feed at night when there is a moon, and are therefore less hungry than after dark nights.

This does not apply to Boca Grande where the moon is necessary for night fishing.

The days of the changes of the moon, especially the first day of the new moon, are the best days during the month for tarpon fishing. The probable reason for this is that the tides are high and strong at such times, which means more food or more inclination to feed, for the new moon increases the activity of all fish.

When on a fishing trip I never dry my lines. Salt water preserves linen lines and a wet line is stronger than a dry one. The lines must be thoroughly dried indoors at the end of a fishing trip. Never dry lines in the sun or wind for they are fatal. Lines used in fresh water must be dried daily.

After a day's fishing unreel the line and reel it on again with care. This is done to take the strain off the reel-drum and to prevent the reel from spreading.

Split bamboo rods are the only rods that are strong and durable enough for heavy fishing. For ease and comfort fish with a rod that is not over six inches longer than you are tall. Long rods are back breakers.

When I first visited Catalina Island in 1900 I broke at the butt, a defective 6 ft. 9 in. rod, which, when repaired, was 6 ft. 5 in. long. With this rod I killed 13 tuna that weighed 1,411 pounds in fourteen days and discovered the advantage of a short rod. I now fish with split-bamboo rods in one piece, tip and butt all in one, 6 ft. 5 in. long.

My success at Catalina in 1900 was the cause of the Tuna Club Rules. The Secretary of the Club informed me as I was leaving the island that they had desired that an experienced tarpon fisherman should try the tuna but that they were disappointed with my "great success!"

The Tuna Club Rules followed. They were quite right to limit the size and strength of lines but an angler should be allowed to choose his own length of rod. It takes better hands to fish with a short stiff rod than with a long pliable one and in heavy fishing comfort and ease is the desideratum.

If the insects are bad use:

3 C's

Oils of Camphor, Cedar and Citronella in equal parts. For the bites of insects Pine Oil is the best palliative. If subject to sunburn "Face Paint" is an absolutely sure preventative. It makes one look like a Red Indian but it is pleasant to use and no sun has the slightest effect on skin covered with this mixture.

Prescription for Face Paint to Prevent Sunburn

3 oz. Yellow Ochre
2 oz. Burnt Sienna
4 oz. Mucilage of Quince or Flax Seed, or bandoline, Rosewater, to make one pint. Shake well before using.

Put in a large-mouthed bottle and apply with absorbent cotton and when nearly dry, spread evenly over the face with the fingers.

## Records

As far as my personal knowledge is concerned the first tarpon was landed with rod and reel by Mr. W. H. Wood on March 25th, 1885, bottom fishing in Surveyors' Creek, Florida. Mr. Wood's great ambition was to land a tarpon while fishing from the shore or beach.

I know of over a dozen fish that have been taken that weighed 200 pounds or more.

The first was landed by Mrs. Stagg and weighed, I believe, 205 pounds.

Edward Vom Hofe's fish followed on April 30, 1898, 210 pounds at Captiva Pass, Florida.

N. M. George took one of 213 pounds at Bahia Honda, Florida, on April 8th, 1901.

Dr. Howe wrote me from Mexico that he had captured a 223-pound tarpon at Tampico.

The largest tarpon I ever saw was caught off Tea Table Key, Florida, on May 15th, 1904. I was told that it weighed 224 pounds. Charlie Thompson, a professional fisherman, was the lucky angler.

W. A. McLaren holds the record for a fish taken in the Panuco River, Mexico, on March 27th, 1911. Length 7 ft. 8 ins.; girth 47 ins. Weight 232 pounds.

Mrs. W. Ashby Jones caught a tarpon in the Caloosahatchee River, Florida, in 1916, that weighed 210 pounds.

Mr. B. W. Crowninshield has a record of 25 tarpon taken between sunrise and sunset at Boca Grande and I believe Mr. L. G. Murphy has a like record at Aransas Pass.

The greatest fishing I ever heard of was done by Mr. and Mrs. Magill on a cruise along the west coast of Florida in 1915. They captured 176 tarpon that weighed 16,377 pounds. The heaviest fish weighed 196½ pounds, eleven weighed over 180 and forty over 150 pounds each.

There were 785 tarpon weighed at Useppa Island in 1917 and but 23 of them weighed over 150 pounds.

At Aransas Pass, Texas, the following fish were liberated after being measured:

| | | |
|---|---|---|
| 1906 | 1,573 | |
| 1907 | 1,333 | |
| 1908 | 700 | Beginning of light tackle |
| 1909 | 720 | |
| 1910 | 800 | 49% on light tackle |
| 1911 | 718 | 66% “ “ “ |
| 1912 | 530 | 64% “ “ “ |
| 1913 | 960 | 78% “ “ “ |

The falling off between 1907 and 1908 was partly owing to the introduction of light tackle but also to the extension of the jetties which made the channel dangerous and rough.

In the 90's the tarpon that were weighed would average about 100 pounds but of late years the average has fallen to about 80 pounds. This would lead one to believe that the number of heavy fish is decreasing.

I believe that the tarpon of over 150 pounds in weight are of great age and that they grow very slowly. I judge this from the fact that they are dainty feeders, for there is very little undigested food found in them when examined.

Several thousand fish have been destroyed yearly for over twenty-five years and although it is now the custom to liberate most of the hooked fish many of these tired tarpon become the victims of piratical sharks and those that are taken in nets are usually destroyed by the fishermen owing to the damage they do to the nets.

# THE TUNA IN THE MEDITERRANEAN

# THE TUNA IN THE MEDITERRANEAN

THE tuna, horse mackerel, tunny, or great albacore.

There are four varieties of this fish known, but they do not differ much excepting as to size, and in the color and length of their fins.

The blue-finned Tuna (*Thunnus thynnus*) is the best known variety along our eastern coast. A new variety, not known until lately, has been taken in the Gulf Stream off the coast of Florida and named the Allison Tuna or *Thunnus allisoni.*

The tuna is a skin fish with scales forming a corslet around the pectoral region.

Tuna grow to a great size, weighing 1,000 pounds and more, and measure over 15 feet in length.

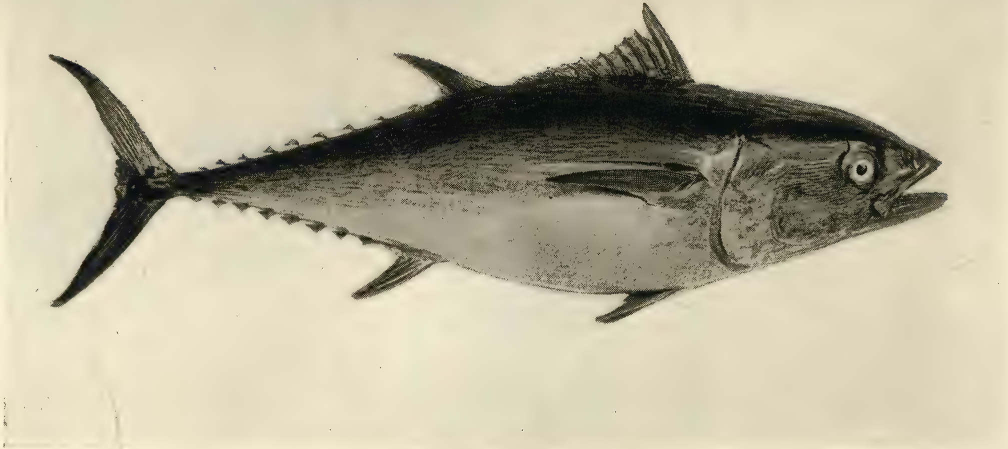
They are fast swimmers, travel usually in schools of approximate weight, and are to be found in most parts of both the Atlantic and Pacific oceans.

The tuna's habits along this coast are very little known, excepting that they appear off the shores of New Jersey and Block Island in midsummer, and that the largest fish are to be found off the coasts of Nova Scotia and Cape Breton Island and in the Bay of Gaspé. They are, however, much more numerous in the Pacific Ocean along the coast of California and further south.

The tuna are most plentiful in the Mediterranean where they have been known and captured for centuries. The tunnyfish of the ancients was described by Pliny and its praises sung by Oppian.

It is in these waters that the fish and its habits have been studied since the earliest times, and here they are now fished for by thousands of fishermen and taken in stationary nets that cost great sums.

It was reported that one net at Cape Bon



THE BLUE FINNED TUNA

on the coast of Tunis took during the months of May and June, 1911, 12,859 tuna that weighed about 1,285,900 pounds (642,950 kilos). This happened in a fat year for that district, a lean year producing about half that number of fish.

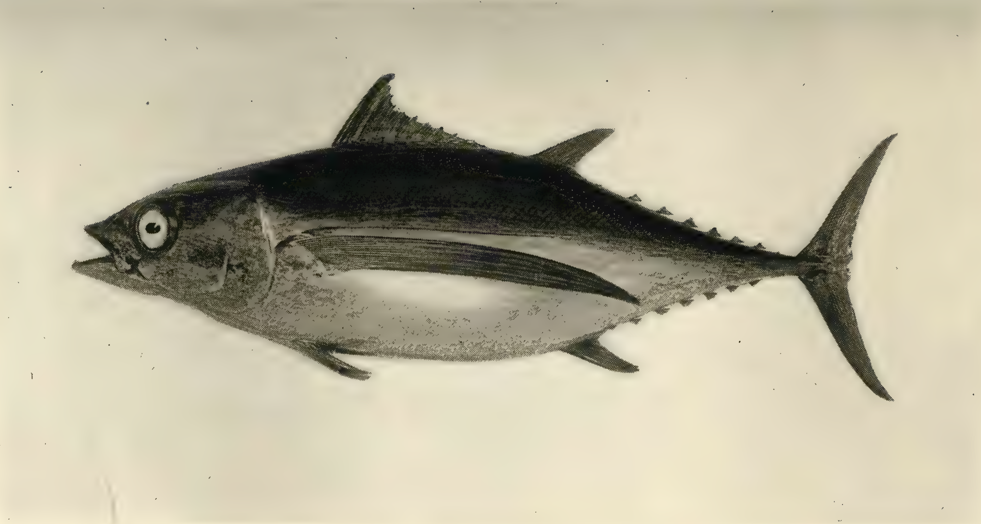
The ancients believed that the tuna all came into the Mediterranean in the spring from the Atlantic Ocean, and all passed through the Bosphorus into the Black Sea where they spawned, and that after this had been accomplished, they all returned to the ocean. It is said that the Golden Horn received its name owing to its rich tunny fisheries.

In the XVIIIth century a Sardinian naturalist named Cetti discovered that all the tuna did not enter the Black Sea, for tuna ready to spawn were taken in the waters off Sardinia, and the young fry were also found in these waters. As tuna are now taken in the Mediterranean at all times of the year, although in different localities according to the different seasons, the theory now is that these fish do not come from, nor do they return to, the Atlantic Ocean.

King Carlos of Portugal studied the tuna for many years, and it was his opinion that the shoals of these fish which appear in the Bay of Biscay in the spring, probably attracted by the East Current of the Gulf Stream, do not pass through the Straits of Gibraltar but, after a few weeks, move off shore again. As far as I can discover, the greater part of the Bay of Biscay fish are albacore or what they call white tuna in Spain owing to the pale color of their flesh.

Along the south coasts of Spain and France every season in the month of July, there are quantities of tuna feeding on anchovies, sardines, and mackerel. When the cold weather arrives they sink into deep water, but keep reappearing during the winter when the weather is fine. In the early spring these fish all disappear.

They are next heard from in May and June when the fish arrive in large schools,



THE ALBACORE

known as *spawning fish,* along the coasts of Algiers, Tunis, Sicily, and Sardinia, and it is here that they are taken in great numbers in standing nets.

These are all mature fish, ready to spawn, and it is in this part of the Mediterranean that the spawning occurs.

The female fish spawns in deep water. The floating eggs are promptly fertilized by the males, and float until hatched.

After spawning, the fish depart in shoals and are known as *erratic fish* for they are here, there, and everywhere, hunting for food wherever it may be found. This happens yearly without fail, only some years they are more numerous than in other years.

During the so-called erratic season the fish are taken chiefly by trolling.

It is supposed that they move from place to place following their food, but also that they seek agreeable temperature and salinity of the waters. This is the reason they select the eastern part of the Mediterranean for spawning purposes.

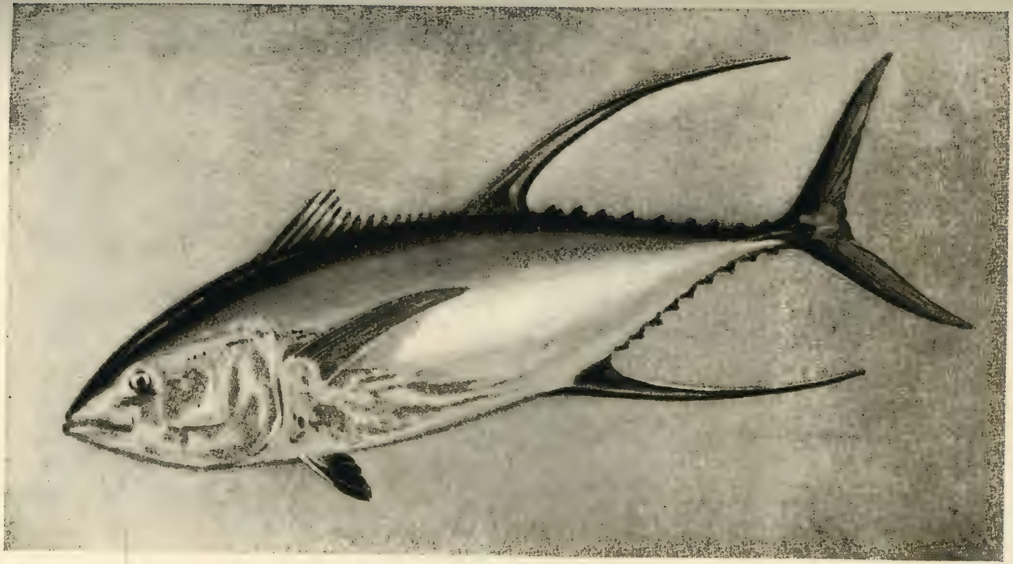
All fish are uncomfortable as their spawning time approaches; they cease to feed and all their functions are devoted to the one purpose. They then seek waters where they can be more comfortable or breathe more easily.

The salmon ascend rapid running rivers looking for more oxygen and the tuna go to that part of the sea which has the most agreeable temperature and salinity, for there they are more at ease. In the highly salted water, life is more pleasant under those circumstances. It also has to do with the better flotation and hatching of the spawn.

As the continents are always flowing into the sea, the salt that is dissolved from the rocks of the dry land, by the rain, finds its way into the ocean and causes its waters to be salt.

The average amount of salty matter the sea water contains is 3½ pounds of salty material to every 100 pounds of sea water.

Different parts of the sea differ in salinity.



THE ALLISON TUNA

It is greatly increased by evaporation, as in the Red Sea for example. In a general way the salinity depends upon the climate. It is less where the rainfall is great than where the climate is dry, and where a hot sun causes intense evaporation.

The eastern end of the Mediterranean is a *cul de sac* with no tides, and great evaporation takes place.

The temperature of water that the tuna prefer is between 55 and 60° F.

The waters of the Atlantic Ocean flow through the Straits of Gibraltar into the Mediterranean, forming a current that follows the African coast and turns where the eastern and western Mediterranean join. It then returns to the westward along the French and Spanish shores, and, being then salty and heavy, flows out into the ocean beneath the incoming waters.

During their erratic season the tuna frequent this westward flowing current, for it seems to suit them best and probably contains more of the small fish they feed upon than do the other parts of this enclosed sea. The flow of this current is slow and is affected by the winds; it moves in shore or off shore according to the wind, and the fish follow its gyrations.

There is no doubt that the tuna in the ocean are influenced in a similar manner, but it is difficult to follow their movements in such a vast expanse of sea.

When they leave a locality for years at a time, as happened in the waters of the Channel Islands of California a few years since, it must mean that the temperature of the water had changed owing to shifting currents, and was uncongenial.

These water conditions, I fancy, have never been studied there except by amateur fishermen, so that very little is known concerning the currents and their effect on the fish; nor has it been discovered where these tuna spawn.

It is only very lately that the tuna has become a commercial fish in the Pacific, for the millions of pounds of so-called canned tuna has consisted of albacore, a smaller relation of the tuna, but the fishermen now have strongly constructed nets in which they take tuna as well as albacore.

As a rod fish it has been known in California since 1898, when the first fish was taken and the Santa Catalina Island Tuna Club was founded. Since that time the fish, although migratory, have given great sport, some hundreds being landed annually by rod and line with flying fish for bait. The heaviest fish captured weighed 251 pounds.

Several heavier fish have been taken off the coast of Nova Scotia and at Cape Breton Island in a similar manner.

Mr. J. K. L. Ross's fish taken in 1911 at St. Ann's Bay, C. B., weighed 680 pounds, and Mr. L. D. Mitchell took a tuna near Medway, N. S., a few years later that weighed 710 pounds.

In the Mediterranean a 500 pound tuna is the great exception; most of the fish weigh under 100 pounds each.

In midsummer tuna appear off the northern coast of France and large individuals have been reported in the North Sea.

As far as my observations go, the large fish off the coast of Nova Scotia travel in small schools of six or eight fish.

During their erratic season, the tuna are taken along the southern coasts of France and Spain by trolling from small seaworthy vessels with strong lines rigged on outrigger poles. Bait is used with large strong hooks.

Permanent tuna fisheries and fish factories exist along the northern African coast, around the island of Sicily, and at other places in the eastern Mediterranean. In setting the nets advantage is taken of a strange fact. The fish are known to travel in certain directions along the coast as their spawning time approaches, and when they meet with an obstruction, always turn to the left. A strong, deep net is anchored offshore and is secured to kedges. It is a trapnet open towards the sea, and the inner chamber has a strong floor and contains a slack net. When the fish are intercepted by the fences, they turn to the left and keep following the fence until they arrive in the inner or death chamber, *camera di morte.* The watchman having announced the arrival of the fish, and the fishermen, armed with strong gaffs, having appeared in boats, the inner gate is closed. After hauling in the slack of the stout net, the slaughter begins.

A lucky net in a fat year will take hundreds of fish a day and, in a good season, net $10,000 or more.

The meat is salted and canned, and every part of the fish has a commercial value.

# THE MYSTERIES OF THE EEL

# THE MYSTERIES OF THE EEL

GENERATIONS of naturalists both in Europe and America have been puzzled concerning the life and habits of the eel, and it is only lately that the mystery has been solved by the Danish zoölogists, Petersen, Schmidt and Gemzoe.

The eel is of great importance as a food fish in Northern Europe, and it is there that its life habits have been thoroughly studied and finally understood.

It had long been known that large eels descend and leave the rivers in the autumn and that small eels, known as elvers, ascend the rivers in millions every spring.

As it is difficult to determine the sex of an eel, it was supposed for a long time that they were hermaphrodites, then again they were thought to be viviporous, and later that it was certain that they spawned in the sea near the coasts, but all these assumptions have been found to be erroneous.

There are two species of the Common Eel (*Anguilla vulgaris*); one is to be found in the rivers that flow into the Mediterranean and eastern North Atlantic, but is absent from those that flow into the Arctic Ocean and the Black Sea. Some others inhabit the countries bordering the Indo-Pacific from the Cape of Good Hope to the Sandwich Islands, but there are none in West Africa.

The American Eel (*Anguilla chrysipa*) occurs in the rivers of North America which empty into the Atlantic, but there are none on the Pacific coast in South America.

There are no eels in South America and West Africa owing to the coldness of the depths of the South Atlantic, and the waters of the Black Sea contain too much sulphuretted hydrogen to please them.

The Danes have marked eels at the headwaters of streams with small metal discs. Some of these fish were later taken in the

Baltic, and again in the North Sea and along the Atlantic Coast. After this, the elvers having been recognized as the fry of the eel, several sea journeys were undertaken for the purpose of finding out exactly where the large eels were bound to, and where the young elvers came from.

In this manner it was discovered that the eels of both Europe and America, spawn in the spring of the year, in the deep warm ocean between the Sargasso Sea, and Bermuda.

The young, upon hatching, do not at once assume the form of the adult eel, but pass through the "leptoscephalus" stage. These were formerly supposed to be a special form of marine life, but were later discovered in the transition stage—developing into elvers or small eels.

The "leptoschepali" are about 4 inches long, and are transparent ribbon-like creatures that do not feed for the first year. They are carried north in this form for two years by the Gulf Stream, and in the spring of the third year, gradually develop into elvers, or young eels, as they approach the coast. They are still transparent and do not become brown on the back until later.

As each female eel is said to spawn one million eggs, the elvers must amount to trillions in numbers as they divide into schools on arriving off the coast.

The first elvers that arrive are smaller than those that appear later, and are mostly male fish which remain in brackish water among the estuaries and marshes of the coast and do not grow very large.

The large elvers which arrive later are females. They ascend the rivers and enter the brooks, lakes, and ponds, for fresh water is just as agreeable to them as salt and they need more oxygen for their greater development than do the smaller male fish.

They arrive in the rivers by thousands and travel upstream in schools, separating into bands that enter the tributaries and brooks.

At this period they are captured in the

rivers of France and Spain by the millions. It is said that these elvers run 2,000 to the kilo, and that 50,000 kilos are often shipped from one station during the spring season.

The French cook these small fish as we do the whitebait. They are said to be very palatable.

When the eels arrive at their destination, they settle down to feed and then grow in size. They are very voracious and, although supposed to be scavengers, will eat anything, either alive or dead, that comes their way. They even attack the female shad in the gill-nets, and mutilate them for the purpose of obtaining the roe, and they consume the eggs of the shad and other fish after deposition. They feed chiefly by night and pass the day in shaded places or deep holes.

It is possible for eels to travel across country after or during rainy weather. Their gill-covers being small, they can remain in the open air with comfort as long as these small openings remain moist. They travel at night from stream to stream or from pond to pond and hibernate in the mud and ooze during the winter.

The scales of an eel are small and oblong and are embedded in the slimy skin. Annual zones or rings form on the scales, so that with the microscope their age can be determined.

When the female eel is 6½ years old, or older, she is ready to undertake her nuptial journey. She is then at least 18 inches long. She dons her wedding garment and becomes a "silver eel." Her eyes grow in size to increase her seeing powers in the dark, deep sea. She then begins her journey to the ocean.

Those that are in brooks and streams work their way down stream to the tide water, where they are joined by the males that are from 5½ to 9½ years old which accompany them on their long journey to the southern seas.

All the silver eels that are in a pond will sometimes leave during a stormy wet autumn night. If the pond is near the sea, they go directly into the salt water from the beach.

I know of one such pond in Rhode Island. When the natives think the "silver eels" are ready to migrate, they dig a trench between the pond and the beach. This ditch may be found to be half full of squirming eels on the first morning following a rainy night.

In case an eel finds its way into a well or a pond out of which it cannot escape, or is frozen in on its way to the sea for a season or two, it becomes non-sexed and then grows to a great size and age. Individuals have been taken that weighed 25 pounds and were supposed to be at least 25 years old.

On their journey to the southern seas they fight the current of the Gulf Stream; or it may be that there is a counter-current below the Gulf Stream, water flowing south, which aids them on their long journey.

It is not known what becomes of the mature eels after spawning, but it is supposed that they all perish.

The life history of the eel is the antithesis to the interesting life of the salmon.

The eel apparently must spawn in the warmest water of the ocean, and the elvers, when three years old, seek the brackish and fresh water for more oxygen to assist them to grow and develop. On the other hand the salmon fattens and grows in the deep sea, and the mature fish journey to the headwaters of rapid running rivers, seeking water that is replete with oxygen which enables them to breathe and live during their trying spawning season, and in which the eggs hatch and the fry live for two or three years before going down to the sea to grow into grilse and full-fledged salmon.

# FISH FACTS
# AND
# FANCIES

~~VOLUME~~ II
Part

A CRITICAL MOMENT

# FISH FACTS AND FANCIES

## VOLUME II

BY
F. GRAY GRISWOLD

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# THE SALMON

# THE SALMON

IT IS well known that salmon do not enter all rivers of the same watershed, but select those that are the best adapted to their purpose — namely, rapid-running streams that are well aërated by the tumbling of their waters. Is it the oxygen in the water that they desire for their comfort and well-being, and also for the proper hatching of their spawn and the growth of their progeny?

The river Adour, in the southwestern part of France, rises near Bagnères de Bigorre, and travels leisurely through the level country of the Landes before flowing into the Gulf of Gascony not far from Bayonne. It has two affluents that come from the south, named the Gave d'Oloron and the Gave de Pau. These rivers rise high up in the Pyrenees, and are rapid-running, tumbling, turbulent streams that drain the northerly water-shed of this mountain chain.

The salmon that enter the Adour do not follow the main stream above its junction with these two mountain torrents, but do ascend both of these branches for the purpose of spawning. As the main stream would be much more easy for them to navigate, it must be the quality of the water that they seek, — water that is well aërated and replete with oxygen. The rivers Aven and Belon, in Brittany, have a common outlet to the sea. Salmon ascend the Aven, but none are ever found in the Belon. It is the quality of the water in the Aven that the fish demand.

The more one studies the salmon, the more one is impressed by the theory that it is the oxygen in the water that they seek, and which enables them also to find their natal rivers when on spawning bent.

If you ask an angler by what power a fish is enabled to find its natal river the reply is invariably, " Instinct."

Instinct is the natural, unreasoning impulse by which an animal is guided to the performance of any action. The migration of birds is an instinct. The first symptoms of winter induce the birds to fly south, and the spring breezes inform them when it is time to return to their nesting country.

When you speak of instinct in the migration of birds, you have to take their marvelous eyesight into account as well as their knowledge of direction and of the air currents, and when you speak of the instinct of location in some animals their keen sense of smell must be considered.

Fish are supposed to see about thirty feet under the best conditions of light and water. Their power of scent is unknown, but I believe it to be much more keen than is supposed. They can and do follow the scent of their prey along the bottom, yet the scent of a trail soon becomes lost in deep water.

It hardly seems possible that the salmon that dwell in the sea can find the river in which they were born by instinct, that is, by instinct alone. The deep sea cannot have many "landmarks," and the tides and currents do not have great effect on the depths of the ocean.

The theory that the salmon go to the rivers and select the upper waters for their spawning beds in order to protect their progeny from their enemies, hardly holds good when you consider that their offspring are in greater danger from their many enemies in the air in the shallow water, than they would be in deeper water down-stream.

We know by experience that in fish hatcheries there must be a continuous flow of well-aërated, cool water in order to hatch the eggs of the Salmonidae, and that the young fish will not thrive except under like conditions.

The first and chief impulse that causes the salmon to return to fresh water is the strong sexual feeling of reproduction, and the instinct that it is only in well-aërated fresh water that their spawn will hatch, and their young, the parr, will grow and thrive.

If, as some people believe, the salmon return to the rivers because they are by nature fresh-water fish, and were at one time landlocked, one would then suppose that they would feed and thrive in their "natural element," and not fast and lose twenty-five per cent of their weight while on their nuptial journey and during their honeymoon.

Salmon are also supplied with teeth, which are of no value to them in fresh water; but, being predatory fish when in the sea, these teeth are then of great assistance.

I believe that there are wide districts in the ocean where the salmon find cafeterias of plentiful food, and that they feed leisurely and well with no great effort. The abundant fat of the fresh run fish can thus be accounted for.

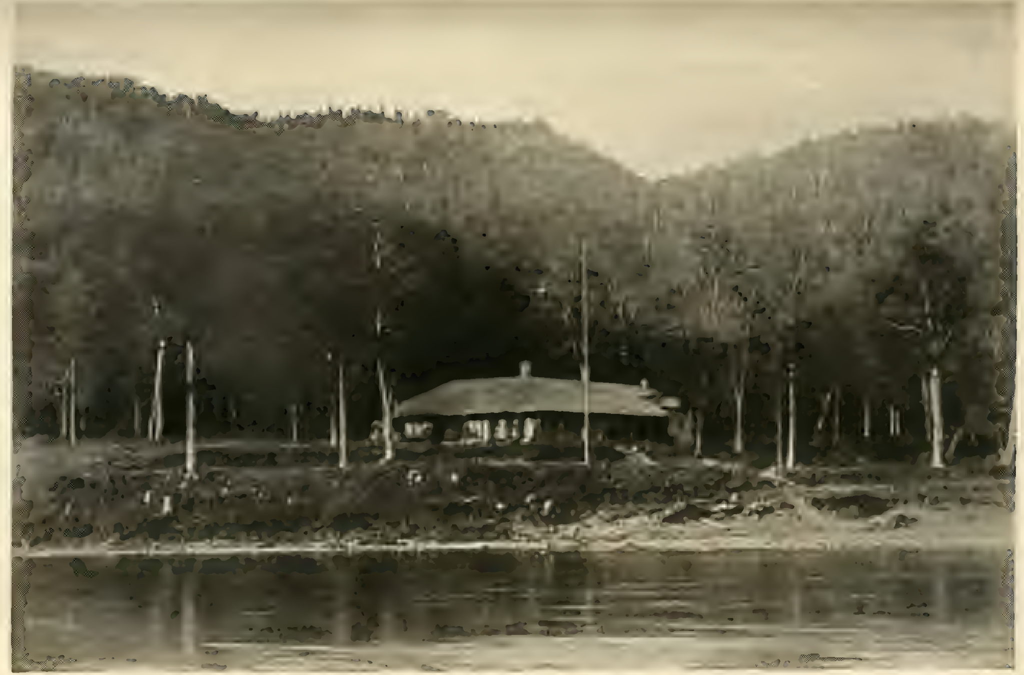
It is supposed that salmon are "geared" to their natal rivers, and return there in preference to any other stream. This has been proved by the return of fish that have been tagged or marked. It is also possible to note a stray salmon in a river owing to its different conformation from that of the native fish.

The Upsalquitch is a tributary of the Ristigouche. The salmon of these two rivers differ in shape and are easily recognized by an expert.

It is the survival of the fittest during a long number of years that has given each river its individual average weight and shape of fish, for the unfit perish after the severe upstream journey and the distress of spawning.

The Red Salmon or Sockeye (*O. nerka*) of the Pacific "spawns only in a stream above a lake in which the young as far as known, pass their first year."

Professor David Starr Jordan says in his book, "The Days of a Man": "The Chinook and the Red Salmon ascend streams to their fountain head. Salmon are known to run up the Yukon as far as the streams at the head of Lake Labarge — that is, some 1800 miles. Both King Salmon and Red Salmon go up the Columbia to the Bitter Root Mountains of Idaho, a distance of over 1000 miles. The Red Salmon has never



LORD LANSDOWN'S CAMP NEAR DERREEN, 1865

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once been seen in a stream without a lake. Yet it makes no difference whether the inevitable water lies only five or six miles from the sea, as in the case of Lake Boca de Quadra, or whether, as in the case of Lake Labarge, it is enormously distant. And why is the Red Salmon alone so attracted to lakes while all other forms are totally indifferent to them? It is as yet unsolved." He further tells of a man named "Captain Callbreath, whom he met on the island of Etolin in Alaska, who, arguing that Etolin streams had no salmon merely because none ever spawned in them, had yearly stocked the Jadeska River with Red Salmon, expecting to reap a harvest at the end of four years. But the appointed time passed and no salmon came. He therefore waited six years, ten years, and so on, year by year, upheld by the pathetic obsession until his death. The fatal flaw in his scheme lay in the fact, of which he would hear nothing, that Red Salmon spawn only above lakes, never even entering a lakeless river."

How do Red Salmon distinguish rivers that have lakes and those that have not? No one knows.

"Each Red Salmon river has its own breed, which is distinguishable and physically adapted to meet the distance it is forced to travel. Thus the Boca de Quadra salmon, which enter their short stream just before spawning time, could not possibly make the long trip to the lakes of Fraser River."

It is known that the run of Sockeye or Red Salmon is three times greater every fourth year. This happens in the year following leap-year. The reasons for this have never been explained.

"An obstruction was caused in Yale Canyon, on the Fraser River, in 1913, by the collapse of the side of a railway tunnel, which choked the river at Hell's Gate. This being one of the recurrent "big years," before the river could be cleared, untold millions of salmon perished trying to force the blockade. As a consequence, four years later, in 1917, the following big year, the pack of salmon was little more than a fifth of the big year of the former cycle."

There were 365,336,482 pounds of salmon and steelhead trout taken on the western coast of North America in 1909, and probably a like weight of fish perished after spawning.

The number of salmon in the Pacific Ocean must be prodigious. As they are known not to return to the rivers before their fourth year in the sea, there must consequently be a three years' supply of fish in the ocean at all times. This all tends to prove that their natural habitat is the ocean and that, when a salmon decides that the moment has arrived for it to do its bit towards the continuance of its clan, it returns to its natal river for this purpose.

We know from the nets that the salmon that enter the Bay of Chaleurs in the spring follow the coast line, and enter their natal rivers. The Bonaventure and Grand Cascapedia fish arrive a week or more earlier than do the salmon in the most westerly of the rivers, the Ristigouche.

The story of the salmon, when in the sea, is, after all, mere conjecture. Every angler has a right to his own opinion on the subject.

My surmise is:

### *The Sentimental Journey*

The natural habitat of the salmon is in the sea, and being "square-tailed fish" they must be bottom feeders.

The rings on the scales tell us that they fare better in the sea in summer than during the winter. They also make us acquainted with the fact that, as a rule, salmon spawn but once. This may happen with the cock-fish when a grilse or later, but with the hen-fish never before the second year in the sea. There are each season an undefined number of salmon in the ocean that became inspired by the strongest call of nature. This does not happen with all these fish at the same moment, which would account for the early and late run of salmon.

Their sexual organs begin to develop, and it is believed they lose their appetite and breathe with increasing difficulty. To relieve their distress they seek more oxygen or better aërated water than can be found in the sea.

The salmon inspired by the increased inflow of fresh water from the rivers, caused by the melting snow and the spring freshets, leave their winter habitat and approach the land, for the tidal waters are well supplied with oxygen by the wave action on the coast, and by the outflow of aërated river water. Here the fish are more comfortable and can breathe more easily.

They follow the coast line until they arrive at the mouth of their natal river, which they recognize by the " taste " of their home waters in which they were raised, and where they dwelt during the first three years of their existence. They linger here for a short period, drifting in and out on the tides until, becoming accustomed to the change from salt to fresh water, they ascend the river.

They dwell for a time in preference in those river pools that lie below rapids, in water that is being continually aërated, and finally proceed to the upper and narrow waters in order to promote the proper development of their spawning powers in a condition of water that is the best adapted to their comfort and ease in breathing. Here they remain for five months, more or less, before spawning.

The reason that the salmon ascend the rivers months before their spawning time, is that nature tells them that fish that are weakened by the development of their ovas would be unable to surmount all the obstacles in a salmon river.

After spawning, many of the Atlantic salmon die while others drift down to the sea. An uncertain number remain in the rivers all winter, and descend to the ocean in the spring as mended kelt. These fish, although still emaciated, have regained their silver livery which they lost at spawning time.

Extracts from

# THE ARTIFICIAL AND THE NATURAL BREEDING OF THE SALMON

I. Hatching to Introduce a Species to Virgin Waters

II. Hatching to Restore Depleted Stock

Extracts from

# THE ARTIFICIAL AND THE NATURAL BREEDING OF THE SALMON

By W. L. Calderwood, F.R.S.E.

*Inspector of Salmon Fisheries of Scotland*

THERE is a recognised difficulty in arriving at a just conception of the value of artificial Salmon Hatching, because of the impossibility of separating the various influences which affect a river or district, and of attributing to each its proper value.

At the outset we have to recognise that Salmon Hatching may be resorted to for two different purposes, viz., either to introduce salmon to waters where they have not existed previously, or to restore depleted stock in waters where for one reason or another a serious decline has developed.

Results are likely to be quite different in the two categories, because in the first the elements which commonly produce decline are absent, and the new stock have not to compete against the factors which in the second have proved deadly to the old stock. It may be they have to compete against other factors, but the deadly developments organised by man are absent.

In observing results of hatching to revive former stock, it has to be noticed that alteration of the conditions not infrequently takes place while results are emerging. For instance, if overnetting be regarded as the cause of decline, a reduction of netting may be brought about. This immediately introduces increased natural reproduction as a possible modifier of the situation. If the accredited cause is obstructions or pollutions the erection of salmon passes or of purification plants will act in the same way.

Gross pollutions may be regarded as the one fatal disability against which all reproduction, whether natural or artificial, is powerless, since it kills both the fish and the food which the fry of the fish feed upon.

Salmon Hatching has been a conspicuous success in the virgin waters of New Zealand, while in other places, as for instance in the greatly utilised waters of the Eastern States of America, where abundance of salmon existed in the past, most patient attempts at restocking have resulted in frequent failures. All through the history of artificial salmon breeding most unequal results have been obtained from apparently similar operations. It is true that again and again great successes have been declared, and that as a consequence various States in America, and Provinces in Canada have developed their hatchery operations on a scale of great magnitude. Yet we are still surprisingly ignorant of the precise nature of the results which may be expected from operations with which everyone is familiar, and we are apt to find, on careful scrutiny, that many of the declared successes are somewhat visionary.

The study of this matter is of no small

importance, since immense sums of money are expended in many quarters, in the full assurance that by artificial means the evils of overfishing can be overcome, and that other operations of various kinds which diverse interests introduce into our rivers may be carried on without hindrance, if only we go on stocking. A more thorough knowledge of what success may be reasonably expected under certain conditions, seems to be needed.

### I. — HATCHING TO INTRODUCE A SPECIES TO VIRGIN WATERS

Perhaps the most successful operations in New Zealand, up to the present time, have been the introduction of the *Quinnat* from the Pacific Coast of North America.

The first importation of Quinnat eggs was in 1875, but no results appeared. Several other shipments of eggs followed, down to the year 1880, and all were failures. The eggs were allocated to a number of rivers over a wide area, from Auckland to the extreme south, and in no place had the numbers been sufficient, apparently, to establish the species. In 1900 the New Zealand authorities decided, wisely, to concentrate upon one river, and they chose for this purpose the Waitaki, which flows east to the sea at the southern end of the Canterbury Bight. The selection was made because the Waitaki was considered to have the same characteristics as the Quinnat's native rivers on the Pacific coast. From 1900 to 1907 annual shipments were made, each of half a million eggs. The reported loss in transport was not more than about ½ %. In seasons 1905 and 1906, Quinnat were found spawning in various tributaries of the Waitaki. In 1907, some 50,000 eggs were collected in New Zealand from fish found spawning. More recently it is reported, officially, that a steady increase has been apparent every season, and further that the species has spread over quite a number of rivers in the South Island.

The success in the original river was immediate, in that within five years the adult fish were spawning in the river. After 22 years, the species has become established in a large number of rivers, and in the last (1922) report of the Marine and Inspection of Machinery Department of the Dominion, the further fact is noted that the fish have crossed Cook's Strait which separates the North and the South Island, and have appeared in two large rivers of the North Island. The following quotation from the Report cited speaks for itself: — "These salmon are now so solidly established in New Zealand waters that the time has come when large quantities should be put on the market, and I would recommend that next season fishermen should be encouraged to catch them for market, and also that the Department should prospect for schools of salmon off the north Otago and Canterbury coasts, and, by using the proper trolling gear, demonstrate to fishermen how salmon are caught off the Pacific coast of Canada and America in the sea for market. I am convinced that once fishermen find out how the schools of salmon travel along the coastal waters at certain seasons they will be able to catch them in large quantities."

In operating with Sockeye, some curious results have appeared. Eggs were imported in 1902, and adult specimens of this fish began to appear in 1907. Dead examples were first noticed, and these were found to have spawned and died in the usual way. A brief note in the last official year book states that " a number exist in Lake Ohau, having acquired a land-locked habit. These fish run up creeks at the head of the lake and spawn there every season in March and April." Lake Ohau is at the head of the River Waitaki already referred to, which flows east and enters the sea at the south end of the Canterbury Bight.

With regard to *Salmo salar,* the history of the attempts is spread over a considerable period and includes many disappointments. The first shipment was made as early as 1868, and by 1902 some fifteen attempts had been made without success, partly, no doubt, because in those early days the art of transporting eggs long distances had not been studied with sufficient care, and steamship companies had not been induced to provide special low temperature water supply for eggs. For a period of forty years, or up to 1908, no proof existed that the Atlantic salmon had been acclimatized, but now the Government decided as in the case of the Quinnat, to concentrate upon one locality, and chose the River Waiau in Southland, at the south end of the South Island, and a hatchery was put up in the upper waters near the outlet from the lake at the head of the river; the hatchery to hold a million eggs.

A quarter of a million eggs were obtained from Canada in 1908, and a million from Britain in 1909, and in 1911. An attendant accompanied the eggs, and the loss was only about 1%. Adult fish have now been found spawning in the tributary into which the majority of the young hatched fish were put, three of them being procured and diagnosed as *Salmo salar.* Smolts also have been caught by trout anglers near the mouth of the river for the last two years, and these must have been the product of previous spawning.

In view of the conditions under which the Quinnat became established and in the absence of competing factors other than natural enemies in the sea, there seems ground for the belief that the Atlantic salmon is becoming acclimatized, and that the species will gradually spread as the Quinnat has done. A period of thirteen years may be said to have elapsed since the beginning of the concentrated effort.

These New Zealand operations stand alone in the history of hatching because in no other part of the world have the conditions been of the same untrammelled nature. Success was not attained till attempts were concentrated in one definite locality instead of being distributed over a number of rivers. This indicates that, even in a single unfished district, there is a point between numbers of new stock and of natural enemies which has to be passed by the outnumbering of the enemies, before the new stock can establish itself.

### II. — HATCHING TO RESTORE DEPLETED STOCK

It is evident from the numerous accounts of the past that before the rise of commercial fishing as we know it in these days, the stock of salmon reached a condition of very great abundance.

If the natural surplus be removed by netting, the stock becomes stable, and if a larger number of fish are caught than can be reproduced by the fish which remain, the stock begins to decline.

With the presence of an alarming decline, we come up against the real problems of hatching as practised artificially, or rather as practised by man in an intensive imitation of Nature.

We want to know just how much better we can do than Nature, and this presupposes that we know what Nature does. As a matter of fact our knowledge of natural reproduction and its results in adult fish is extremely limited, and we suffer from a plague of guessers.

In order to prove benefit by artificial hatching, it is necessary that the product in adult fish be greater than the product arrived at by Nature.

Enthusiastic advocates of artificial hatching generally put their trust in the undoubted fact that a very high percentage of eggs can be hatched out without much difficulty, and in the argument that in Nature the same high percentage cannot reasonably be expected.

I am disposed to admit that the truth of the statement is highly probable, but what we want to note is this, that *the benefit must be the difference between the artificial and the natural results.*

It is too loosely assumed that any production of young fish is so many young fish to the good. The idea is quite erroneous. If artificial hatching is a benefit in the case, say, of a river where a great amount of natural spawning is possible, and where spawners from the river are used, the benefit is measured by the difference between man's product and Nature's product, not by man's product alone.

### *The Natural Redd*

If a natural redd be carefully opened, one does not find many eggs either living or dead or unfertilised — I am referring to *S. salar*. There is no sign that the living eggs will not hatch out, or that they run any great danger from enemies. Even from floods the danger is not so real as many are inclined to think, for the salmon does not choose ground which has a shifting character. Large expanses of beautiful looking gravel are frequently left alone, and we do not know the reason till we wade across the river bottom and find that the gravel is loose. Further we never find eggs at all in the hollow, or " nest " as American writers call it.

THE CASCAPEDIA METHOD

The eggs are amongst the piled up gravel below the hollow, to which position they are naturally carried by the current, as the stones are also carried. The small number of eggs found in any one redd simply means that the salmon does not shed all her eggs at once, but distributes them amongst several redds in the course of a week or ten days. In this way stretches of suitable gravel become scattered all through with eggs as spawning proceeds.

All the eggs in the ovaries of a female do not become ripe at the same time, but all the eggs extruded are so completely ripe that the chances of fertilisation are at the maximum.

Investigations into the spawning habit of the Quinnat salmon in the Sacramento River were made by Mr. Cloudsley Rutter (Bull. U. S. Fish Comm. 1902, p. 67), in the course of which he formed the estimate that the percentage of eggs fertilised is high " probably about 85%." His experiments in the catching of eggs from nests, and his attempts to induce fish to spawn in artificially constructed gravel beds were not very successful, and one is struck also by his account of the formation of " nests " by the Quinnat. Mr. Rutter considers that the nest or redd is not prepared in any way for the reception of the eggs, but is incidental to the flexing of the fish's body when near the bottom, which flexing of the body, he says, is probably for the purpose of loosening the eggs from the ovaries. He also makes the definite statement that the eggs are not covered up in the gravel but lie amongst the " rocks " and stones, and that a covering of even an inch of fine gravel kills the eggs. This last statement suggests that he does not think of the eggs as being safe in coarse gravel as compared with fine.

I have no experience of the spawning habit of any of the Pacific Coast species, and I have read several accounts of the eggs of *Oncorhynchus* lying thickly on the gravel of rivers, and of large quantities being dead. I am inclined to think that this appearance has been common in the past, when great quantities of Sockeye and Quinnat were in the rivers, and when the gravels became, as it were, overcharged with eggs, and were used again and again by fish so that large quantities of eggs floated out of the redds and died. I have supposed also that this appearance has given rise to the belief frequently expressed by American writers that a very high percentage of eggs are unfertilised and die. At the same time Mr. Rodd, the Canadian fish culturist, informs me that the Quinnat salmon do not naturally cover their eggs so completely as Atlantic salmon do.

In *Salmo salar,* if any are not covered at once they usually get eaten up by attendant trout. I have opened, and seen opened, many trout caught near salmon redds at spawning time, and they have been invariably gorged with salmon eggs. Further, if eggs are not covered, and are allowed to lie exposed to full light, mortality is always high. It is natural for the eggs to incubate in the dark or in very subdued light. Also, eggs on the bottom of a river would be moved about by the current and swept away to destruction in floods. If eggs are moved about during the early stages of development, they die.

I notice in Canadian official reports that in the transplanting of eggs of Sockeye and Quinnat to the upper sections of the Fraser River and elsewhere in British Columbia, the eggs are buried in the gravel. In other words it seems clear that Canadian fish culturists regard eggs covered in gravel as safer than eggs sown on the bottom of a river. I shall refer to the egg planting box now used in British Columbia in a later part of this paper.

### *Properties of the Salmon's Egg*

If a salmon's egg be thrown smartly on a board or flat stone it rebounds like a rubber ball. Also the freshly extruded egg swells after fertilisation, and for several minutes is slightly adhesive. These two characteristics are of special value, and taken together give opposing qualities, so that the egg may be likened to a gummed ball which will still bounce off objects, but when once at rest will slightly adhere to any of them until, as it were, the gum is washed off. In this way the egg readily rebounds from stones which strike it, but on falling against stones by reason of its own specific gravity, while the redd is being covered, is not very readily detached by the current. By the time the redd is completed, the adhesive character has passed away.

It has been supposed that the swelling of the egg and the adhesive character were interdependent; that the swelling was caused by the entrance of water through the egg envelope, and that this inflow of water caused suction on the surface of the egg and so caused the egg to be slightly adhesive till the swelling of the egg came to an end. Recent investigations seem to indicate that this is not the case, but no other view is supplied.

If an experiment be made by scattering eggs in a redd, and throwing stones over them in a down stream direction, it will be found, when the stones are removed, that the eggs are uninjured though they may have considerably changed their former positions, and are in all cases lodging in the interstices between the stones. Also, it is not necessary for a stone to strike an egg to dislodge it. The water-cushion in front of the falling stone, or the current set up by it, is usually sufficient to do so. An egg never seems to be caught between stones and crushed. The specific gravity is so delicately balanced that it shoots into safety before the stone reaches it. When Mr. Rutter admits that newly hatched alevins, when turned into a river, bunch together, and are so conspicuous, by reason of their brightly coloured umbilical sacs, as to be easily seen fifty yards away, he has also to admit that under natural conditions alevins are never seen in this way. The condition is the result of artificial methods. In the Atlantic salmon neither eggs nor alevins are seen because they are safely buried in the gravel. To turn alevins into a river is simply to provide food for predatory fishes and birds, since the protection afforded by Nature is then sacrificed.

## *Approximate Natural Hatch*

It has been stated by observers who show a strong bias in advocating artificial methods, that 70% of the eggs are killed before they hatch. This appears to be quite a random statement, but it is then easy to show by actual figures that a far higher percentage can be obtained by hatchery methods. I have known a loss of under 2%, and in specially favourable years there may be batches of eggs hatched without any loss. From enquiries I have made as to the experience of those who have regularly carried on salmon hatching in Scotland for many years, it would appear that a 3% loss is not far from the usual result, but that an average to take in the occasional disastrous season through exceptional circumstances and accident, would require to be quite 5%.

It is by no means easy to ascertain what percentage may be hatched in the bottom of any river, but I know no better means of arriving at an approximation than by referring to the results obtained in British Columbia from the use of a propagating box devised for the transporting of eggs to outlying districts, and designed by District Inspector Harrison. It is referred to by Mr. Rodd, Superintendent of Fish Culture in Canada, in his Reports for 1922 and 1923. Twenty million salmon eggs were transported by the use of this box in 1922, and from Pemberton Hatchery alone on the lower Fraser 12,000,000 were transported to the barren spawning grounds above Hell's Gate. The special box is made with a bottom which can be withdrawn in two sections, each section of the sliding bottom being on a slant upwards from the central line. The box is designed for carrying, and is two feet long, and ten inches broad. In depth the centre is 10″ and the ends 6″. In carrying, it is lashed to a Yukon pack board on a man's back. A layer of gravel is placed on the bottom to a depth of about 1½ to 2″, a layer of eggs is then carefully scattered, then another layer of gravel, and another layer of eggs, after which gravel fills in the remaining space. Between 3000 and 4000 eggs appear to be the maximum load.

When taken to the place where the eggs are to be planted, a trench is dug in the gravel of a natural spawning bed, the box is placed in it and the bottom withdrawn. The contents of the box then lie in the surrounding gravel as part of the natural spawning bed, and the remainder of the box can be lifted out.

Mr. Rodd, in his 1923 Report, gives a few results, one being with a lot of 2000 eggs which yielded 1940 fry, i.e., all but 60, or a loss of 3%.

By the use of a hatching box, which seems to be called "The Kashmir Box," in the Yorkshire Esk, Dr. English, with eyed eggs, had a loss of 3%, and from the account of his experiments given in *The Fishing Gazette* of 22nd April, 1922, it appears that the eggs were placed without gravel in a simple shallow box of square shape with perforated upstream and downstream sides and a lid, and kept at the bottom by being fastened to stakes.

The approved method of restocking employed in New Zealand is to sow eyed eggs in selected gravels of the river bed, and for this purpose a sowing device is employed which enables five furrows to be sown simultaneously.

For purposes of restocking in widely separated areas, it appears to me that the use of a suitable planting box is likely to be greatly increased in the future rather than the much more expensive method of erecting hatcheries. Eyeing stations do not require the complete and protracted operation demanded in hatcheries, the eggs can be moved with comparative safety, and the benefit to the river is the higher percentage

TRACADIE

of fertilisation, and the consequent saving of the 15% or so of loss in the initial stage.

With regard to the Fraser River all recent accounts go to show that the immense extent of river above Hell's Gate, where the disaster occurred in 1913, are either quite without salmon or occupied by most insignificant numbers of fish. It was only from this upper section of the river that the four-yearly cycle had its origin. Depletion of the stock had been gradually going on since the late years of last century, but the rock slide at Hell's Gate, happening as it did on a "big year," wiped out the big run of Sockeye, because the big run depended upon the occupation of the hundreds of miles of spawning grounds of the upper river by the enormous numbers of fish which formed the big run, and because Sockeye do not spawn more than once.

Presumably some similar cataclysm had, at some early time, closed the upper waters in great measure for three years. If this be so the big run as it was at first known represented merely the average run before the early supposed cataclysm. If the species had been *Salmo salar* the natural disaster would have been overcome after a number of years, since this species enters fresh water to spawn at a variety of ages, and there are at all times more fish in the sea than in the river.

Professor Gilbert by his careful scale reading over many years has proved the existence of local races in different parts of this great Fraser River system. Not only the scales, but the weights of the species in different tributaries, and the size of the eggs they produce have been pointed to by others as signs of quite separate races which inhabit, at the spawning time, the particular part of the river system with which they are associated. The Harrison Lakes fish, for instance, have never shown the four-yearly cycle. They inhabit the region many miles below Hell's Gate and the tributary which enters from the north in this lower region.

Admitting the presence of those local races and the prescribed areas they inhabit, it is not impossible for ordinary processes of migration to go on, and for members of one local race to penetrate new waters. It was in this way that the Quinnat migrated and gradually spread in New Zealand so that they are now across Cook's Straits and in the rivers of the North island. The fish culturists of Canada do not trust to the Sockeye doing the same in sufficient numbers to enable the upper reaches of the Fraser to be restocked. No doubt the process would be a very slow one, and Mr. Rodd points out, in a letter to me on the subject, that the Hudson Bay Company's records of the Fraser catch go back for more than a hundred years, and during all that time the four-yearly cycle continued without the lean years in any way harmonising with the big years, or vice-versa. Commercial fishing began in 1876, but did not reach any great proportion for quite a number of years. Mr. Rodd is therefore developing the system of seeding the upper waters by means of transplanting eggs in the carrying boxes.

One thing which seems clear from these Pacific Coast operations is that there may be hatching on an unexampled scale, so that in one State alone a hundred and eighty-six millions of eggs may be dealt with in one season, and yet the salmon catch may continue to decline simply because a reduction of capture does not accompany the effort to increase the stock by hatching. It is a relative question, and if the amount of netting had not been so great as to cause serious decline, the amount of hatching would have succeeded in greatly enhancing the stock.

Further it is possible, when certain depleted tributaries or creeks are concentrated upon, and heavily stocked, to develop artificially a marked increase in the tributary or creek.

But we are still in need of definite information as to the amount of increase which can be relied upon after certain operations have been carried out, and of a working scale to guide us in the relation of artificially hatched fry to the natural product of a river.

The control of a river, and a knowledge of all fishing results in it, is necessary in an attempt to get this information, and the Fishery Board for Scotland have arranged, thanks to the assistance of Sir Charles Ross of Balnagown, Bart., who is the proprietor of the river Oykel in Ross-shire, that an attempt be made in that river during the next few years.

The proposal is to impound a certain number of the spring run, ascertaining by scale examination in the case of each fish that it is of spring run; to hold up these fish to the autumn, and then to strip them; to hatch the eggs in a hatchery; to rear the fry and parr to the smolt stage in a convenient burn adapted for this purpose; to mark all the smolts before they are liberated; and to fish a trap in the river for their recapture on return from the sea, and to ascertain at the same time the natural stock of the river.

## *Conclusions*

1. When virgin waters are stocked, complete success can be attained by concentration on one particular river and the introduction of sufficient numbers of eggs or fry to overcome natural loss.

2. In the case of rivers depleted of their stock, the removal or reduction of the cause of the depletion should accompany artificial propagation.

3. In natural hatching, a loss of 15 % for unfertilisation, and a further loss of 15 % may be estimated before the fry stage is reached.

4. In *Oncorhynchus,* marking of fry in large numbers, by fin cutting, has twice given a result showing the recapture of adult fish equal to $1\frac{1}{5}$ %.

5 In *Salmo* the return of fry as adult fish (Weser) is 3–5 per 1000. Marking of

smolts (Tay) gave results of 20 per 1000 and 30 per 1000.

6. The benefit of hatching as compared with natural reproduction is the measure of the difference between man's product and Nature's product, not of man's product alone.

7. From official reports, hatching to the extent of 186,000,000 eggs annually may accompany a decline of the fisheries.

8. The use of Planting Boxes for the depositing of eggs in natural spawning gravels yields encouraging results, the loss being from 3 % to 20 % to the fry stage.

# THE AGE OF ATLANTIC SALMON

# THE AGE OF ATLANTIC SALMON

IN 1922 Mr. J. A. Hutton, the great authority, reported that he had examined 14,000 sets of salmon scales in fifteen years and " had come across only three fish that had spawned three times." Last year Mr. Hutton received the scales of a Gulf of St. Lawrence salmon which bore four spawning marks, and he estimated that the age of the fish must be twelve years. Prior to this no fish over eight years of age was on record.

A salmon was taken in Loch Maree during the past season and from its scales the following life history has been deciphered:

Hatched in 1913, went to sea in 1916, returned as a small spring fish in 1918 and again 1919, 1920, 1922, returned to spawn for fifth time in spring of 1924.

This would lead one to believe that the salmon have a much longer life than had been supposed, and that they may live many years in the sea after they have lost the inclination to return to fresh water.

Mr. Calderwood, of the Fishery Board for Scotland, has sent Mr. Adams a most exhaustive and interesting report on 250 sets of scales taken on the Moisie in 1923. This report indicates that about 95 % of the salmon taken were ascending the river for the first time, and these fish, with few exceptions, could be divided into four classes as follows:

*Class* 1. Salmon which have spent two years in the river and two years at sea.

*Class* 2. Salmon which have spent three years in the river and two years at sea.

*Class* 3. Salmon which have spent two years in the river and three years at sea.

*Class* 4. Salmon which have spent three years in the river and three years at sea.

Classes 1 and 2 contained fish weighing from 7 to 12 lbs., while Classes 3 and 4

LUMBER CAMP SCOW

contained salmon weighing from 12 to 32 lbs.

It is interesting to note that some of the fish had spent four or five years in the river before going to sea, but there were no cases where fish had spent more than three years at sea before returning to spawn.

Three of the fish showed three spawning marks, and most of the fish which had already spawned had spent one whole summer at sea between their spawning marks.

## FISHING TACKLE

The Multiplying Reel
Casting Lines
Salmon Flies

# FISHING TACKLE

## THE MULTIPLYING REEL

WHEN I first took up fly-fishing, being a sea fisherman and accustomed to modern weapons, I was surprised to find that little had been done to improve trout and salmon tackle. What is in general use today differs little from what was in the fashion fifty years ago.

The rods have been lightened in weight by the adoption of split bamboo for the heavier and more brittle greenheart, and Hardy, of Alnewick, informs me that 80 % of the trout and salmon anglers of Great Britain at the present day use split-bamboo rods.

It is chiefly the salmon reels that lack modern improvements. They also have been made lighter in weight in late years by the substitution of aluminium and hard rubber for heavy metal, but their slow-working, single-action and old-fashioned brakes are still universal.

The finger-nail-destroying brake is practically impossible to adjust when you are hard pressed by an active fish, and it is quite out of date.

After much conversation, I persuaded E. Vom Hofe to build a multiplying salmon reel for me, and had it improved by having two small pins placed opposite each other on the brake button. I was assured that the reel would not give satisfaction, but was not impressed by the assurance.

I took fifty salmon with this reel last season with great comfort to myself and much discomfort to the fish.

When an angler fights a salmon it seldom happens that his rod is not straight and his line slack at some moment or moments during the battle. This is owing to the fisherman's inability to recover line quickly with the slow-working, single-action reel, and it accounts for many a lost fish.

There is a pool on the Grand Cascapedia called Tracadie. At the foot of this pool a narrow island divides the river current into two long, tumbling rapids. I was fishing Tracadie one evening last season and hooked a salmon which I succeeded in leading up stream to the gaff by strong persuasion, but the second fish made for the rapids with flying colors. As the bowman stowed his killick, he remarked: "Now we are in a mess, — we will not know on which side of the island the fish goes."

Under ordinary circumstances he would have been correct, for the salmon had taken most of my line before the canoe was well under way. As a canoe once started is moved faster by the strong current than a hooked salmon can swim in shallow water, the line becomes slack, and it takes a few minutes for an active man to reel in this slack and get in touch with his fish.

As I was, however, fishing with the multiplying reel, I said: "Follow the taut line."

The fish under complete control (that is, under a steady strain from the rod) navigated the right-hand rapids, and arrived just ahead of the canoe in the smooth water below, and quite ready for the gaff.

When dry-fly fishing for salmon, the multiplying reel is necessary, for when casting upstream a fish often rises when the line is slack, as it must be if the fly is properly presented. In that case the line must be more quickly retrieved than it can be by a single-action reel, for you cannot hook a fish with a slack line.

The multiplying reel has one drawback. Owing to its necessary double-cogged wheel-action, the pivot of the handle cannot be placed in the center of the reel. As the handle must, therefore, extend beyond the rim of the reel, an angler who strips and shoots his line is always in danger that it may foul the reel handle.

As this reel has double the power of the ordinary salmon reel, it must be handled with a light touch or the tackle suffers.

FALLS OF THE MINGAN

### CASTING LINES

I fancy all salmon anglers are annoyed by the fact that the dressing on their casting lines lasts so short a time.

If you ask a tackle dealer why this is he will tell you that an angler when stripping his line scrapes it against the side of his reel, but I find it also happens when care is taken to strip the line straight.

In my opinion the damage comes from a fault in most salmon reels. The line does not lead true from the reel-drum to the rod but passes over a revolving pillar, which it should not do.

What kills the dressing on a casting line is the cold water, the pressure on the line passing over the revolving pillar, and also the pressure of the tightening of that part of the line which is still on the reel when playing heavy fish. The dressing cracks and peels off, leaving the line in a rough and unworkmanlike condition.

Most new casting lines are too stiff and this can be corrected with a little trouble.

When I buy a new line I treat it to a bath of warm turpentine in which a cake of paraffin has been dissolved. The line remains in the solution over night, is left to dry for a day, and then is rubbed down with a cloth or chamois skin.

If a line is treated in this manner it becomes much more supple, retains its polish, and will not crack. It casts better, lasts longer, and remains good to look at and pleasant to handle.

## SALMON FLIES

Why do salmon take the fly and what do they think it is?

It cannot be that it represents any article of food to which they are accustomed when in a river. Perhaps it resembles something that reminds them of food which they have enjoyed in the sea, and the life-like, fibre movement of the feathers on a fly may awaken their predatory instincts.

Every angler naturally has his favorite fly, probably because he has succeeded with it; which means, that he has fished with it more often than with any other fly, for the one with which he perseveres will bring him the most fish.

We all know that in selecting the proper fly to fish with at any special moment, the height and volume of water would decide the size of fly, while the brightness or cloudiness of the sky as well as the color of the river bottom would decide the shade of fly that should be fished with.

The vagaries of salmon must be admitted, also the fact that a fly when presented looks quite different to the fish if cast with the sun or against it.

Lord Grey, in his delightful book, selects four flies as his choice: Jock Scott, Wilkinson, Black Doctor, and the Torish. These four flies are all embellished with what I consider the most useful salmon fly feathers, namely, the Jungle Cock, for the spots on these feathers appear to open and shut, that is, increase and decrease in size, as the fly is manipulated. This is most agreeable to the salmon, or most disagreeable if you believe that they rise because they are annoyed.

Other celebrated anglers have advised quite different selections, and I do not believe that it really matters much, if the size is correct, what pattern is used if the fly is properly presented.

Each year I exclude more and more patterns of flies, and, although I deny myself much ocular pleasure I take as many fish, for I believe that we lose more than we gain by carrying about a large number of fancy flies and changing them too often.

In order to try an experiment I had a special fly tied which I christened the "Griswold Gray." With flies of this pattern I took last season eighty-one salmon that weighed 1711 pounds, forty-eight of which were taken with one identical fly and cast.

This does not mean that I could not have done as well with the same sizes of Dusty Miller, Mar Lodge, or Black Dose, but it does mean that I wasted no time in changing flies or trying experiments.

We are all too prone to change our flies on the slightest provocation. The fly in which an angler believes, and with which he perseveres, will bring him more fish than any other.

As salmon are both monocular and near-sighted, as well as frequently dormant after a night's journey, they often do not see the fly that is being offered to them. This must be taken into consideration when selecting the size of fly with which to fish.

Salmon are not as easily frightened as is often supposed, and the splash of a large fly in strong water often draws their attention when a small fly would not do so.

On the Ristigouche Club waters in 1924, 30 rods took 1808 salmon in 526 days' fishing.

The successful flies were:

| | |
|---|---|
| Black Dose | 555 |
| Mar Lodge | 551 |
| Silver Grey | 188 |
| Night Hawk | 135 |
| Jock Scott | 131 |
| Dusty Miller | 113 |
| Assorted | 135 |
| | 1808 |

This is interesting, for although the weather for the most part was fine the darker flies took the most fish. There is no doubt that a dark fly can usually be more easily seen than a light one, especially late in the evening when much of the fishing is done.

The Grand Cascapedia River is sixty miles farther east, and also empties into Bay of Chaleurs. It is a smaller and more rapid river than the Ristigouche, and the pools of the latter river are more placid.

On the Club Waters of the Grand Cascapedia, 7 rods took 589 salmon. The successful flies were:

| | |
|---|---|
| Dusty Miller | 207 |
| Black Dose | 87 |
| Griswold Gray | 81 |
| Mar Lodge | 58 |
| Jock Scott | 48 |
| Durham Ranger | 20 |
| Silver Doctor | 19 |
| Silver Grey | 7 |
| Assorted and Dry Flies | 62 |
| | 589 |

As I very seldom fish after sundown, my brilliant fly did good work. If I had fished in the evening I would then have used the Black Dose or Killer, both black flies.

Fashion exists in the choice of flies as in other things. A few years ago the Silver Grey and the Silver Doctor were favorite flies on our river, but both are now in the discard.

There is little doubt in my mind but that the sizes and patterns of salmon flies are of more importance to the anglers than to the salmon.

# THE UPSTREAM JOURNEY

# THE UPSTREAM JOURNEY

I HAD believed for a long time that there was yearly an early run of salmon in our river, consisting of large male fish, and that they did not dwell long after once entering the river, but kept travelling upstream until they arrived at the spawning beds. This I did not have an opportunity to study until last season.

A fellow angler and I were fishing the Middle Camp waters during the third week in June and, although the sport was good, I suggested one evening that we should journey the following day to Lazy Bogan and try our luck.

It is twenty-six miles from Middle Camp to Lazy Bogan, and they are long miles for the current is swift and there is much rough water. As it is a long journey, and one is limited to twelve salmon per rod in the Upper Waters, it is hardly advisable to arrive there ahead of the fish.

My fishing partner assured me that it was too early in the season to go, for the salmon had arrived late, and it was hardly possible that they could be in the upper pools. We consulted our canoemen and they all agreed with my friend. This did not convince me that I was wrong, for I had noticed that many salmon in the river were journeying upstream by daylight. This they seldom do, for, when in fresh water, they are as a rule nocturnal travellers.

During the season I speak of a fish that rose short to a fly did not return to his berth on the river bottom, but would move on upstream. I had even met fish fighting their way up rapids in broad daylight. This had convinced me that many salmon must already be at the headwaters, where they assemble in numbers to await the spawning season, so I persuaded my men to take me upstream the following day.

Our first day's journey was to be eight miles of hard poling, for that stretch of river falls quickly and contains many rapids. The river was high and the current was strong; under such circumstances it takes much muscle and great strength to drive a canoe up stream.

Although it is a delight to sit in a canoe and gaze ahead at the charming scenery, and to watch the bird life on the river, one is soon overcome by the fact that the canoemen are overburdened by the passengers' weight, and one becomes inspired with a desire to land and walk along the river bank.

I sat quite still for two miles, and then asked to be put ashore. I told the men to meet me three miles above, at Button Rapids. The river road was built in the first place for the benefit of a future lead mine back in the hills, and also to save the spawning beds, which were being disturbed during low-water by horse-drawn scows that carried provisions to the winter lumber camps.

The road meanders along the river bank, and then again winds back into the woods, so that it may cross the tributary brooks at convenient places.

The forest consists of second-growth trees, with a fine specimen of basswood here and there, and owing to much fallen timber is practically impenetrable. Moose and deer tracks are frequent in the soft places and many woodgrouse nest close to the roadway.

I met the canoe and took three salmon, 21. 21. 21., in Lost Channel pool. We then landed, built a fire, made tea and had luncheon. After the men had satisfied their hunger and had had a good rest, we proceeded upstream to Tracadie, where I took a small salmon in the house pool. This satisfied me for, salmon like, my one object was to get upstream, and the men needed a long rest to prepare for the eighteen-mile journey the next day.

We started early the following morning and made good headway, for this part of

426½ POUNDS OF SALMON

the river is easier poling until you reach the Falls, which are three-quarters of a mile of the worst rapids on the river. I left the canoe and walked while the two canoes, for my luggage-canoe was following, fought their way up the rapids, and arrived in the smooth water above about noon.

When we reached Three Islands, which is a pool where the salmon rest, it was very evident that the fish were there, for they were jumping all over the pool. In two drops I took four salmon, 23. 25. 23. 23., and we then adjourned for luncheon.

We arrived at Lazy Bogan, six miles above, at half past three, having flushed six moose as we passed Grassy Bogan.

Here we found Parson's Pool full of salmon, and I soon had my day's limit of eight fish, for in two drops I landed four, 25. 26. 29½. 21. These fish were all short in weight. The one that weighed 26 pounds was 36 inches long, and the 29½ pound salmon measured quite 40 inches. This proved, according to the rule of one pound in weight to every inch in length, that these fish had been up river for many days.

The fish were there in great numbers, and the following morning in a short time I landed six, 20. 20. 20. 17. 20. 21. We then dropped down below the Upper Waters to Three Islands, and secured two more salmon, 18. 21.

Having taken my limit, we started on the downstream journey, picking up the fish we had left at Tracadie, and arriving at New Derreen at 5 P.M., after a journey of thirty-four miles with the stream. The twenty (20) salmon weighed 426½ pounds, and were taken in six hours' actual fishing.

# THE BANNER YEAR OF 1924

## THE BANNER YEAR OF 1924

THE lucky salmon fishermen of Scotland have but a short time to wait between seasons, but the anglers of Eastern Canada have a long autumn and winter of discontent, during which they count the weeks from mid-August to the following June. It is, therefore, only fair that they should be rewarded now and then, as they were in 1924, by the great number of salmon that were to be found in the Canadian rivers.

It is not known why a greater number of salmon ascend the rivers in some years than in others.

Is it owing to a succession of good spawning years, or only on account of an extensive outflow of fresh water?

The latter is the supposed reason, yet it could hardly have been the cause for the superabundance of fish in our river.

The fall of snow in the Grand Cascapedia district had not been a heavy one during the winter, nor had the spring freshets been excessive. The water in early June was about normal, not extremely high.

The fish arrived early and in great numbers. They were, in fact, too numerous, for I believe too great an abundance of salmon is not conducive to a high grade of sport. There must be some persuasion necessary in order to interest the angler. To be able to rise a fish or several fish on every drop in each fishable pool is too easy fishing to please an expert. It is the chase not the killing of the fox that appeals to the hunting man and so it is with salmon fishing. Too many fish become an *embarras de richesse.*

For example, I took 81 salmon on one pattern of fly, 48 of which were taken on one identical fly and cast (*Griswold Gray* 6/0).

There were also many mended kelt in the river. I took and liberated 22 in one day.

THE FALLS RAPIDS

It was often quite impossible to decide that they were kelt until they had been netted, for many of them jumped and fought upstream like fresh-run fish. It is supposed that this unusual number of kelt was caused by a late August run of fish last season. These salmon probably spawned too late to escape to the sea before the river froze.

Towards the end of June the water fell, for we had no rain, and the fishing became more difficult and more interesting. The salmon were so numerous that each member of the Cascapedia Club was allowed to take 100 fish. For a fortnight it was an easy matter to land the limit of 8 fish a day, but 5 salmon usually satisfied me.

### CASCAPEDIA CLUB WATERS

1924

7 Rods
589 Salmon = 12,878½ pounds
Average, 21.86 pounds

75 Salmon 30 pounds and over
Heaviest fish: 40 pounds

Other rivers did well also:

Moisie, 7 Rods, 1126 Salmon
Best day 110 Salmon

### RISTIGOUCHE SALMON CLUB

30 rods, 1808 Salmon = 31,529 pounds
258 grilse

Total 2066

Salmon average 17.43 pounds.

The fishing in Newfoundland in the early season is also reported as having been very good.

It seems to have been the greatest salmon fishing season on record.

### GRAND CASCAPEDIA RIVER

1924

| | | | | | | |
|---|---|---|---|---|---|---|
| Club Waters | 7 | Rods | 589 | Salmon | 12,878½ | pounds |
| Mr. Marshon | 2 | " | 96 | " | 2,119 | " |
| " Phipps | 4 | " | 133 | " | 2,860 | " |
| " Bonbright | | | 319 | " | 7,442 | " |
| " Spaulding | 4 | " | 232 | " | 5,292 | " |
| | | | 1,369 | " | 30,591 | " |

Average 22.3 pounds

Cascapedia Club

December 3, 1924

*Dear Sir:*

A letter from William A. O'Neil, Head Guardian Grand Cascapedia River dated November 27, 1924, respecting his count or estimate of salmon in the river at spawning time, says:

"My count, which I have estimated, is as follows: four thousand four hundred and fifty, and I would safely say that there are about five hundred in Loon Lake, as they were jumping all over the lake, and it was impossible for anyone to count them. There are more salmon in Loon Lake than has ever been seen before, and, in fact, I have never seen as many fish this last thirty-five years as there are in the river this fall, and most everyone I have asked and who has been going up and down the river expresses the same opinion."

Yours very truly,
W. de F. Haynes,
*Secretary*

F. Gray Griswold, *Esq.*,
783 Park Avenue, New York.

# TARPON BY THUNDER

# TARPON BY THUNDER

HAVING for years had a desire to fish for tarpon in mid-summer, I journeyed to the St. Lucie River, Florida, at the end of last July (1924). I was surprised to find, owing probably to the high temperature of the water at that season of the year, that the waters of southern Florida were quite bare of surface-feeding fish. The only fish to be found were tarpon and a few large mullet.

It was warm in the sun, but the heat on the water was tempered by a gentle sea-breeze that blew from ten in the morning until sundown. The nights were still and very hot.

We had thunder squalls almost every day, and they were most welcome, not only because they lowered the temperature and hid the burning sun, but also for the reason that there was little tarpon fishing when they did not occur. I had in the past joined the farmers in praying for rain, but never before had I besought the Almighty to send a thunder squall.

About two miles from the mouth of the river there is a cove of very deep water. Here the schools of large tarpon trade in the summer-time. The water being very warm, the tarpon are listless, and lie dormant on the bottom most of the time, while large mullet may be seen jumping and feeding along the river bank close to the mangroves.

When it begins to thunder, and in the midst of the tropical downpour, the mullet, from fear or for some other reason, move out into deep water, and school. The tarpon then appear on the surface and drive through the schools of mullet, knocking them out of the water and leaping out themselves in their mad hunt. The air is full of jumping fish, both large and small.

In the midst of the tropical storm a fish fracas takes place which I have never seen equalled. Swiftly-swimming sharks encircle the frantic fish, picking up the stunned mullet which the tarpon have overlooked.

If you troll a bait through this riot of fish, you are certain to "hang" a tarpon. Now and then a fresh-run fish would take at other times, but as a rule, without a thunder squall, the sport was poor.

I had not fished for tarpon for several years, and was again greatly impressed by their gameness and also by the fact that they would take a bait six feet from the stern of a moving launch. They seem to have no fear of man or boat, and if not disturbed go about their way rejoicing.

There is an aristocratic something about tarpon that exists in no other game fish.

# THE FIGHTING MARLIN

## THE FIGHTING MARLIN

VERY little is known concerning the life and habits of the Spearfish or Marlin (*Teptraturus mitsikurii*).

These fish are found in the late summer in the waters of the southerly Channel Islands, off the coast of California. A few appear in July and August, but they are usually more numerous during the month of September. Last summer (1923) they did not appear in those waters in numbers until late in October.

I fished eight hours a day for fifteen days during September, and combed the ocean, but did not succeed in enticing a single marlin to take, yet I enjoyed every moment of my fruitless chase.

To me there is no call such as the call of the sea. Some rivers are beautiful, mountains and woods have great charm, but they do not compare with the ever-changing vast expanse of the ocean.

It was evidently the cold surface water that prevented the fish from taking. I saw three marlin, which seemed to prove that they were about, but they did not appear in numbers until after a hot spell of weather in October.

It is evident that they are a warm-water fish and follow the warm sea-currents.

In the California waters they are found singly or in small schools of half a dozen fish, but I once saw a large school of hundreds of marlin off the island of San Clemente. It was a wonderful sight. The sea was quite rough, and as the heavy rollers followed our launch each wave seemed to be full of these giant fish, arrayed in their brilliant colors. They were on the surface feeding on sora, and presented a never-to-be-forgotten fish picture.

Marlin are most interesting fish, for they are the most lively of all fish when once hooked, and doubly interesting from the fact that you may often plainly see their manner of approaching and taking the flying-fish trolling bait.

These fish were for a long time supposed to be too strong and dangerous for anglers to attempt to capture with a rod, and it has, in fact, only become possible since the development of modern sea tackle, and of large reels holding one thousand feet of line and supplied with heavy drags.

Marlin often come to hand when not quite exhausted, and it is sometimes dangerous to attempt to gaff them, as their sword or spike is a formidable weapon.

It is not that they use this spike for the purpose of doing damage, but in their struggles, and before they are securely roped, being long and very powerful fish, the gaffer must keep clear of the marlin's business end or suffer the consequences.

I have a man in my employ who has lived with me for forty years. He is a salmon fisherman, having been raised not far from the river Shannon. I took him to

California one season to show him the marlin. After I had landed my first fish, he remarked: "Salmon fishing is like fishing for butterflies alongside of them fish!"

It was lucky that I had him with me, for without his aid we would have lost one fish.

We started early one morning to hunt for marlin. The deep blue sea was as smooth as glass, and in the distance beautiful Catalina was just emerging from her nightcap of the white clouds which overhang the island in the early morning.

My boatman had told me of a marvelous new gaff that he had invented, and I saw it that day for the first time, lying in the cockpit of the launch. This gaff had been made by the local blacksmith out of a rod of iron, and looked like the shank and one fluke of a small anchor with a fishhook point. It was a weapon illy adapted to its purpose, being too heavy and too awkward to handle quickly.

I had been trolling a flying-fish off shore for about an hour when I saw a large fin following my bait. The fish presently seized one of the teasers, then came back and took the flying-fish. I turned everything loose, and allowed the line to run, guiding it with a slight thumb pressure to prevent it from over-running. When the fish had taken about one hundred feet, I threw the drag on and waited until the line became taut. I then struck hard and hooked the spearfish.

The fun began at once. The fish, swimming in a straight line, jumped fifteen times clear of the surface, and we followed as fast as the launch could travel. The marlin then circled, and the line became slack. Such moments are nervous ones, for reeling-in a bellied line is a great strain on the tackle, as the fish and the angler are both pulling the line sideways through the water.

At such moments it is the duty of the boatman to endeavor to get behind the fish and straighten the line. This is a manoeuvre that is not always easy to accomplish, for the marlin is apt to change its course at any moment.

This fish began to jump again when it felt the pressure of the taut line, and we went after it in hot haste. Having pretty well exhausted its fighting strength by these lively methods, the fish settled down to fight below the surface of the sea, and I had twenty minutes of hard work before the marlin appeared alongside of the launch in full view.

I was pretty busy with the rod, and did not notice when the boatman grasped the wire leader with his left hand that he held the so-called new gaff in the other hand. The first thing that I knew he was calling for help, and asking someone to assist him. Looking over my shoulder I observed him struggling with a fish that was partly out of water.

It appeared that, in attempting to gaff, the too-heavy weapon had encircled the marlin without piercing its hide, and the struggling fish was simply resting in the belly of the large gaff. My man seized a regulation gaff that was lying on the deck of the launch, and plunged it into the fish. The boatman then attempted to rope the marlin's spike, but the fish rose up out of the sea and violently shook its head in an attempt to free itself from restraint. In doing so it struck the boatman in the face with its sword and knocked him down. He fell on his back in the cockpit. He struggled to his feet and put his hands up to fight, thinking that my man Tom had knocked him down. The blood was streaming from his wounded cheek, and he was completely dazed. I put my rod down and joined in securely roping the fish.

The first round had been a knockdown for the marlin, and the second round a battle of three men against one hooked and weary though still lively marlin. The fish lost, and was hauled on board the launch.

The boatman was *hors de combat* the following day with a severe headache and a badly damaged face. I had seen men defeated by gaffed and struggling tarpon, but never before had seen a strong man knocked out by a fish.

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